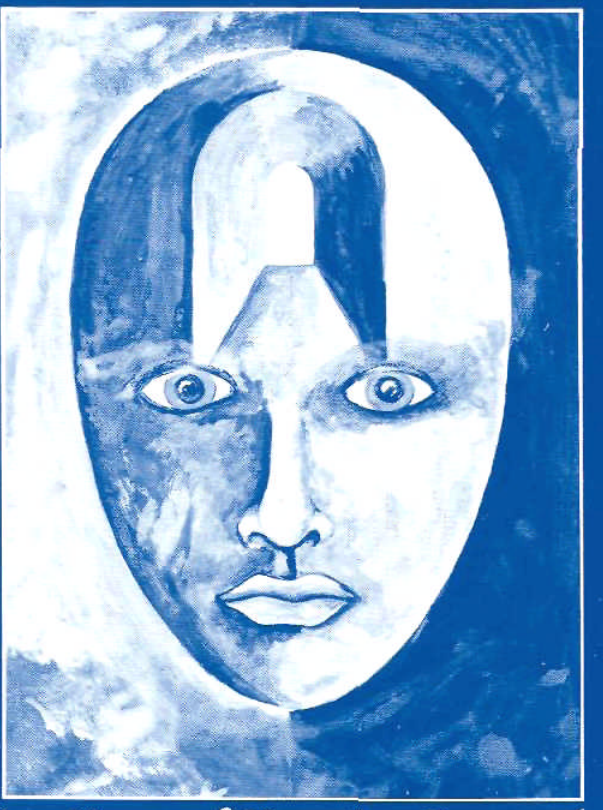
the Skeptical Inquirer

THE ELUSIVE OPEN MIND



Ten Years of Negative Research in Parapsychology

Critique of Serious Astrology / Science, Magic, & Metascience
Velikovsky and China / Follow-ups on Ions, Hundredth Monkey

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the Skeptical Inquirer

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ON THE COVER: Illustration by Kelli Sechrist.

News and Comment

London Newspaper Series on Uri Geller Reveals Long Record of Deception

URI GELLER'S attempt to make a public comeback (*SI*, Winter 1986-87) through talk shows, media demonstrations, and his new book *The Geller Effect* (published initially in Britain and Canada), was dealt a blow recently by publication in London of a newspaper series critically investigating his claims.

The tone and content of the three articles published in the *Mail on Sunday* in October by investigative reporters Iain Walker and John Dale (see Articles of Note, p. 302) are typified by the headline on the first of the series: "Come on Mr. Geller, who do you think you are fooling!"

"A three-month worldwide investigation by The Mail on Sunday shows that his claims do not stand up to scrutiny," the reporters state, "and that he now seems to believe his own tricks."

Britain has a more freewheeling tradition of daily journalism that allows mix of fact and comment (Geller is bluntly called "a huge confidence trick on a gullible public" and "the ultimate 20th century huckster"), but it is the solid reporting that here puts Geller into such unflattering light.

Some examples:

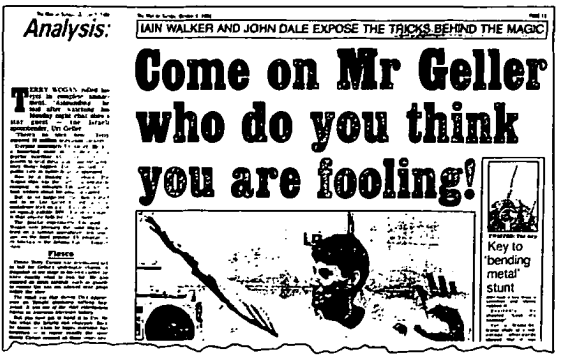
- On a popular British television show hosted by Terry Wogan, Geller, to the audience's astonishment, replicated a drawing he had earlier asked Wogan to make and conceal. Walker and Dale report that in rehearsals for this "telepathy" trick Geller had been peeking. "There was a dress rehearsal for the telepathy trick with myself and the props girl Patricia McGowan," John Richards, a member of the production staff, told them. "Uri told her to draw a picture and said we all must turn our backs. I wondered why he had asked me to turn away. So I looked round and saw Uri had turned slightly and was peeping at Patricia through his fingers. *He was definitely watching her doing the drawing. I actually saw him cheating.*" (Their italics.)
- On the Wogan show, Geller managed to restart a broken watch. "After the show," report Walker and Dale, "we took the watch to expert horologist William Turk. He said: 'I am not surprised Mr. Geller re-started this watch. There is nothing wrong with it. There was a tiny piece of hair on the mechanism, but if anyone shook it in their hands

IAIN WALKER and JOHN DALE ON THE SPOONBENDER'S BIG TEST

Shut up or put up Mr Geller

How Uri bends the truth about big names

Kamikaze dolphins and tunnel vision


Analysis:

IAIN WALKER AND JOHN DALE EXPOSE THE TRICKS BEHIND THE MAGIC

Come on Mr Geller who do you think you are fooling!

Key to 'bending metal' stunt

it would probably start. It often happens with watches that have been unattended for years.' "

• The reporters tested the Geller claim that he can detect a diamond while flying over it at hundreds of feet. (This is part of his new emphasis on consulting to mining companies.) "We showed him 84 matchboxes and asked him to find the one containing diamond, gold, silver, oil, and coal. He blanched and refused. 'I won't do anything—I don't want to fail.' "

The series' second article, "How Uri bends the truth about big names," investigates many Geller claims of testimonials from prominent world figures.

• Geller claims that in Mexico he once amazed and impressed former Secretary of State Henry Kissinger by reading his mind. Walker and Dale contacted Kissinger, who was furious at Geller's claim. "I recall that he performed some sort of mental maneuver which resulted in a bent spoon. However, as to having been able to read my mind and as to the exchanges he claims took place, it simply is not true," said Kissinger.

• Geller claims that at the inauguration of Jimmy Carter he shook hands with Carter and beamed a psychic message to him that the president should spend six million dollars on psychic research. A Carter spokesman scoffed: "Sometimes President Carter has to review these things to see if commenting might give more credence than not commenting. He is not commenting."

• Geller claims that his powers were used by scientists at the Naval Ocean Systems Center in tests to control dolphins. The center's spokeswoman said: "We do not know Mr. Geller."

• Geller claims that the Korean Ministry for National Defence flew him to its demilitarized zone to locate tunnels bored by North Koreans. The Korean defense spokesman told the reporters: "Mr. Geller has never been invited or used by the Ministry."

• Geller claims that in South Africa he discovered coal from a map shown to him by Clive Menell, chairman of the Anglovaal Corporation. Menell told the reporters that Uri was introduced to him by a friend and that as a joke they decided to test his psychic powers. "He didn't do very well," said Menell. "Our geologists put pure gold, pure copper and rock in cotton wool and three test tubes. They were mixed up and Uri's scores weren't very good." Menell told the reporters Geller never found any mineral reserves and was never employed by his company.

• The Australian mining company Zanex paid Geller $350,000 to guide them psychically to diamond and gold on the South Sea island of Malaita. Now some Zanex stockholders are fighting to get their money back, report Walker and Dale. "The fact is that Malaita's potential has been public knowledge for six years."

Gellerism Revealed

Gellerism Revealed, a 95-page booklet by Australian magician Ben Harris on the psychology and methodology of Uri Geller's tricks, has just been published in North America. Among the chapter headings are: "The Psychology Behind the Key Bend," "The Psychology Behind the Watch Trick," "Physical Methods," "Subtleties," "The Cutlery Bend," and "Watch Wizardry." It also contains 91 closeup photographs illustrating methods of key bending, spoon bending, and watch manipulation.

Harris characterizes Geller as a "superb showman" who uses no gimmicked apparatus and whose success with audiences stems from "expert presentation" of "simple but bold tricks."

The booklet is published by Micky Hades International of Calgary, Vancouver, and Seattle and is available in the United States by sending a check for $13.28 (which includes postage) to the publisher at P.O. Box 2242, Seattle, WA 98111.

—*K.F.*

Zanex manager George Reynolds told them: "I doubt if you could say we've had exploration success." They asked if Uri had justified his fat fee? "I would suggest not," Reynolds answered.

• Geller now claims that his early critics have eaten their words and that one of them, conjurer Ronai Schachnaey, even gave him a medal. "Evidently he had changed his mind," said Uri. Walker and Dale contacted Schachnaey in Israel. "That's completely untrue," he said of Geller's claim. "He is deliberately misrepresenting me. I gave him the medal to emphasize he is just a magician, like me. I've always thought him a fake."

Walker and Dale followed up on a Geller claim that he had helped to locate kidnapped American billionaire Samuel Bronfman. The Bronfman family scoffed at this. Say the reporters: "Uri simply pointed at the large borough of Brooklyn on the map—and submitted an $18,000 bill for the service." They reluctantly paid him $180 instead.

Police in New York refuted Geller's suggestion that he had given worthwhile help in catching the "Son of Sam" murderer.

The two reporters also recount previously published investigations exposing Geller's claims and detailing his methods and failures. And they say their own dossier on him gets larger all the time.

The reporters conclude: "The Mail on Sunday has established a pattern of deception over the years which can mean only one thing: Uri does *not* have the psychic powers he claims."

—*Kendrick Frazier*

New Gallup Youth Poll Finds Decline in Supernatural Belief

IN 1984, the Gallup Youth Survey of American teenagers found high belief in ESP and astrology, 59 and 55 percent, respectively (*SI,* Winter 1984-85). The poll results were among the factors that led the Committee for the Scientific Investigation of Claims of the Paranormal to give increased emphasis to astrology in its public education efforts and to issue a much-publicized call on newspapers to carry a disclaimer with their astrology columns (*SI,* Spring 1985).

Trends in Beliefs

	1986 %	1984 %	1978 %
Angels	67	69	64
Astrology	52	55	40
ESP	46	59	67
Clairvoyance	19	28	25
Witchcraft	19	22	25
Bigfoot	16	24	40
Ghosts	15	20	20
Loch Ness monster	13	18	31

Source: Gallup Youth Survey, Gallup Organization, Inc.

Now the Gallup Organization has repeated the poll of teenage belief in "supernatural phenomena." The poll conducted in May and June 1986, exactly two years after the earlier one, and reported this past fall, finds lower levels of belief in all categories polled—angels, astrology, ESP, clairvoyance, witchcraft, Bigfoot, ghosts, and the Loch Ness monster—than in 1984.

Nevertheless the poll shows that roughly half of all teenagers still believe in astrology and ESP.

"Even though the scientific community generally dismisses astrology as being without scientific merit," notes George Gallup, Jr., in reporting the results ("Teen Belief in the Supernatural is Declining," Gallup Youth Survey, October 29, 1986), "a majority of teens (52 percent) persist in believing that the movement of the heavenly bodies can influence events in their lives." Belief is higher among young women (58 percent) than among young men (48 percent). Younger teens tend to believe in astrology more than older ones do.

As for extrasensory perception, "In spite of scientific skepticism about ESP, 46 percent of the teens still believe in its possible existence," said Gallup. "This proportion, however, represents a sharp decline in belief in ESP, from 59 percent in 1984 and 67 percent in 1978."

About one teen in five (19 percent) believe in clairvoyance, the alleged ability to see into the future or beyond normal sensory range. Belief in clairvoyance has declined 9 percentage points since 1984. (The term *clairvoyance* seems to have been fading from use. Might this fact, rather than a diminution of belief in the concept, possibly account for some of the decline recorded by this survey question? It would be interesting to see how the same people would respond to a question about belief in "psychics" or "psychic powers." These are much more common and familiar terms today.)

Belief in witchcraft has declined from 25 percent in 1978 to 19 percent in 1986. Belief in ghosts has declined from 20 percent to 15 percent.

Supernatural Beliefs

	National %	Male %	Female %	Ages 13-15 %	Ages 16-17 %
Angels	67	65	68	68	67
Astrology	52	48	58	54	51
ESP	46	47	45	47	45
Clairvoyance	19	19	20	21	16
Witchcraft	19	17	22	17	22
Bigfoot	16	20	11	15	17
Ghosts	15	13	17	13	17
Loch Ness monster	13	17	9	14	12

Source: Gallup Youth Survey, Gallup Organization, Inc.

Belief in large, still-undiscovered creatures continues to decline. Belief in Bigfoot dropped from 40 percent in 1978 to 24 percent in 1984 to 16 percent in 1986. Belief in the Loch Ness monster declined from 31 to 18 to 13 percent in the same surveys.

Females tend to have greater belief in astrology, clairvoyance, and witchcraft, while males tend to have greater belief in ESP, Bigfoot, and the Loch Ness monster.

Belief in angels remains at high levels, 67 percent.

Teen opinions were measured by response to the following questions: "Which of the following do you believe in—ghosts, the Loch Ness monster, Sasquatch (Bigfoot), witchcraft, ESP, clairvoyance, angels, astrology?"

The results are based on telephone interviews with a representative national cross-section of 504 teenagers, ages 13 to 17.

—*Kendrick Frazier*

Astrology à la Française: Part of the Culture

SHOULD WE believe in astrology?" asked France's *L'Express* news magazine in a special report. The magazine devoted nine pages to examining the subject in articles by several reporters. The theme of the coverage was set right from the start, by dismissing as "futile" such questions as, Is astrology a science? and Is there reason to believe in it or not? "As if that were the problem!" *L'Express* exclaimed (December 1985). "In the end, the question is as irrelevant as it is for Santa Claus. What counts in both cases is that they are an integral part of our culture and that they serve a significant purpose, poetic and social as well as economic."

L'Express based its interest in astrology on a poll conducted by L'Express-Gallup, which showed that more than half of the French believe in astrology—50 percent "a little bit," 9 percent "firmly." Belief in astrology appears to be more widespread among the young (18 to 24 years old), 82 percent of whom said they consult their horoscopes frequently or occasionally. Senior citizens appear to be the most skeptical. More than half (56 percent) deny any belief in astrology, and only 59 percent consult their horoscopes frequently or occasionally.

L'Express compares the results of its poll with one taken 23 years ago. At that time, only 58 percent of the French knew their astrological sign. Today, that figure has risen to 90 percent. Even the 58 percent figure, however, was large enough to prompt *Petit Larousse,* the standard one-volume dictionary of the French language, to change its definition of astrology from "a superstition that died out long ago" to "the art of predicting events by the stars."

The 70 percent of all those surveyed who consult their horoscopes at least occasionally don't have to go out of their way to do so. At least half a dozen periodicals are available that specialize in astrology. The newest of them, *Vous et Votre Avenir* (You and Your Future), has gained a circulation of 100,000 since it began publication in May 1983. *L'Express* also describes the "formidable success" of a computerized astrology service called "Astroflash," created by an entrepreneur, Roger Berthier, and a well-known astrologer, André Barbault. The company, which had revenues of 10 million francs (nearly $1 million) in 1984, serves 300 clients a day, not counting mail orders. Several high-tech competitors have sprung up, one of which—Orélia—has managed to computerize Chinese astrology.

According to *L'Express,* astrologers' consultation fees—much of which is not

reported as income—total billions of francs each year. Well-known astrologers, the magazine says, are concerned about the proliferation of poorly trained and dishonest astrologers. To protect their image, about a year ago the top astrologers in France joined in a federation, the Fédération Francophone d'Astrologie (French-Speaking Federation for Astrology), with the goal of "defining an official standard for the profession" that would include four years of training ending in a diploma.

Moreover, in what *L'Express* terms "an expansionist crisis," French astrologers are exploring new fields, including the astrological evaluation of employees for business owners, and animal astrology.

Philippe Meyer, a senior editor of *L'Express,* proposes a psychological explanation for the popularity of astrology. "Self-discovery is an undertaking that uses up a lot of energy and can follow many different paths. The growing popularity of astrology seems more understandable in that it offers not only the attraction of novelty but also that of the irrational," he explains. He views interest in astrology as akin to interest in genealogy. "Don't yuppies identify themselves as Scorpios or Leos in much the same way that, 30 years ago, their parents who had moved from the provinces to the city still identified themselves as being from the Rouergue or the Ardennes?" he asks.

In an interview with *L'Express,* French astrophysicist Hubert Reeves, research director of the Centre National de la Recherche Scientifique, talks about why he is interested in astrology even though he is skeptical of its value. "Astrology is part of that vast undertaking of the human spirit to locate itself in the universe, to link itself to the universe, so as to give meaning to reality and to life. . . . The widespread renewal of interest in astrology is an important social phenomenon that we must try to understand," he believes. He goes on to list several scientific objections to astrology. But when asked whether he believes it's important to combat astrologers, he responds: "To me that seems the best way to increase their popularity and their prestige. My own approach is to tell people that there is another discourse on man's relation to the universe that is more satisfying and more acceptable to a critical spirit."

—Lys Ann Shore

Lys Ann Shore is a writer and editor. She now lives in Socorro, New Mexico.

A Real Museum Piece: A Psychic's Workplace

HOW DO professional psychics conduct their business? You can find out by visiting a museum exhibit in Paris, France, that features a full-scale exact reproduction of one psychic's business office. The permanent exhibit is mounted in the French National Museum of Folk Arts and Traditions, located in Bois de

Psychic's office on exhibit at Paris museum.

Boulogne on the western edge of Paris. The museum is part of the Ministry of Culture and Communication. As its name implies, the museum is concerned with preserving and presenting traditional French folk culture, from material concerns like food production and preparation to intangibles like folk customs and beliefs.

Entitled "A Psychic's Office, Paris, 1977," the exhibit in question, like many in the museum, is an audiovisual one in which spotlights illuminate sections of the display in time with an audio tape. The tape features the voice of the psychic, M. Belline, who donated the exhibit to the museum. Belline's comments are prefaced with this introduction: "Today as yesterday, in cities as well as in the countryside, many people go to psychics to learn their future. Here is a reconstruction of the office where, from 1954 to 1977, a Parisian psychic—who is still in practice—exercised his profession. . . . He presents in his own words, drawn from an interview, his office and his trade."

Belline's office is a comfortable one, with a fireplace and mantelpiece, a large mirror, bookshelves, a desk, and armchairs. As Belline says, the office "was never a fortune-teller's lair but a place of work and meditation" where he attempted "by using my gifts to help my neighbor in his sufferings and doubts."

In his prerecorded comments, Belline emphasizes that the "simplicity" of the furnishings helps "reject the false idea that a clairvoyant works in the realm of the fantastic or the unreal." He goes on, however, to point out his favorite ornaments, such as "elephants that are symbolic of controlled force and energy," "ivory figurines that symbolize motherhood and love," and "the owl . . . a symbol of wisdom and philosophy . . . the symbol of clairvoyance."

Paintings and photographs contribute to the ambiance. There is a portrait of Belline in a trance, a painting that symbolizes "the third eye," a portrayal of "the cosmic hand," executed by "that specialist in questions of the Beyond, Jean Prieur," and an assortment of photographs of people M. Belline has remembered in his prayers.

Belline draws the visitor's attention to the "jumble" on his desk, which even

includes the medication he was taking in 1977 for stomach problems. Intelligent viewers, he says, will realize that there is no need for gimmickry in a psychic's surroundings. Dramatic decor is merely a way to impress suckers.

In response to the interviewer's request that he describe clairvoyance, Belline defines it as "a gift of sympathy and love." "What is clairvoyance?" he continued. "It's a flash of illumination, a sudden insight that comes to me and shows me a fraction of the future life of the person, or a fraction of his or her past life." To receive this enlightenment, all he has to do is look at the hands of a client who is seated facing him. The crystal ball in his office is just for show, he says. Occasionally, however, he runs into difficulty. "People come to see me who are completely lacking in spirituality. When that happens, there is a wall." To tear down the wall, Belline uses Tarot cards as "a support" for his abilities.

What impression would Belline like museum visitors to take away with them after viewing his exhibit? Simply this: True psychic ability is "a gift of sympathy that pushes you to seize the vibrations of another individual and to place at his service information that would normally be hidden from him. On the practical level, clairvoyance is an interior resonance or a vision in which objects or symbols appear to the psychic in a clear and precise way. The psychic must then interpret these. In principle, the vision is almost always correct; it is the interpretations that are at fault."

—Lys Ann Shore

Indian Group Active Against Sai Baba

B. PREMANAND, India's James Randi and convenor of the Indian National Group Examining Claims of the Paranormal, has commenced legal action against Sai Baba.

Sai Baba is one of India's godmen, but he can also be described as its Uri Geller. He claims to be able to produce sacred ash by waving his hand, resurrect the dead, perform alchemy, and cure diseases by materializing surgical instruments.

Premanand's book exposing Sai Baba's miracles as sleight of hand has gone through two printings. He has now filed a writ in the High Court of the state of Andhra Pradesh alleging that Sai Baba's action in making gold from thin air is a violation of S.11 of the Indian Gold Control Act!

—Mark Plummer

Dear Abby: Good Advice About So-Called Psychic

A WORD of appreciation to Abigail Van Buren. A recent "Dear Abby" newspaper column (September 26, 1986) included a letter from a man who had been swindled out of $3,600. Then he had called a psychic who had advertised in a magazine that he could foretell your future and solve your problems. The psychic said he could get the man's $3,600 back if the man sent him $400 immediately. The writer asked for Abby's advice.

It was forthright and wise: "If this so-called psychic could foretell the future, he would be making a fortune on the stock market and flying his own private jet to Las Vegas on weekends to pick up a little extra cash to bet at the track. Don't throw good money after bad, my friend."

—K.F.

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for the

1987 Annual CSICOP Conference

This conference is sponsored by the Committee for the Scientific Investigation of Claims of the Paranormal, the California Institute of Technology Y, and Southern California Skeptics.

The Pasadena Center

Friday and Saturday, April 3 and 4

Keynote Speaker

CARL SAGAN

FRIDAY, APRIL 3

(at the Auditorium Theatre, Pasadena Center)

8:00-9:00 A.M.: Registration

9:00 A.M.-12 NOON

Opening remarks by Paul Kurtz and Mark Plummer

Extraterrestrial Intelligence: What Are the Probabilities?

Moderator: Al Hibbs, Jet Propulsion Laboratory space scientist (ret.), California Institute of Technology

Jill Tarter, research astronomer, SETI Institute, Univ. of California, Berkeley

Robert Rood, associate professor of astronomy, Univ. of Virginia, Charlottesville

Frank Drake, dean of natural sciences, Univ. of California, Santa Cruz

12:00-2:00 P.M.

Luncheon Recess

2:00-5:00 P.M.

Animal Language: Fact or Illusion?

Moderator: Ray Hyman, professor of psychology, University of Oregon

Thomas Sebeok, professor of linguistics and semiotic studies, Indiana University, Bloomington

Robert Rosenthal, professor of social psychology, Harvard University

Gerd Hövelmann, University of Marburg, West Germany

5:00-8:00 P.M.: Dinner Recess

8:00 P.M.: Keynote Address

CARL SAGAN

Note: Although CSICOP remains dedicated to the examination of paranormal claims, it is equally devoted to promoting science as the best approach to obtain knowledge about the world. It is in this vein that this conference deals with controversial issues from within contemporary science. Instead of examining whether or not UFO reports reflect extraterrestrial visitation, the first session deals with the possibility of intelligence somewhere else in the universe. Instead of focusing on claims that people can communicate without the use of any known physical channels, the second session addresses an equally controversial question: Are primates other than *Homo sapiens* capable of language? The third session deals with controversies in the medical field. Skepticism is as important a tool in the discussion of such issues as it is in the evaluation of claims of the paranormal.

SATURDAY, APRIL 4

(at the Conference Center, Pasadena Center)

9:00 A.M.-12:00 NOON

Medical Controversies

Moderator: Wallace Sampson, M.D., Mountain View, California

Chiropractic Medicine: William Jarvis, professor of health education, Department of Preventive Medicine, Loma Linda University

Holistic Medicine: Austen G. Clark, assist. prof. of philosophy, Univ. of Tulsa

Nutrition as a Cure: Jerry P. Lewis, M.D., professor of medicine, University of California, Sacramento

12:00-2:00 P.M.: Luncheon (optional): James Randi, host.

Concurrent Sessions

(2 separate rooms at the Conference Center)

2:00-3:00 P.M.

The Realities of Hypnosis, Joseph Barber, Neuropsychiatric Inst., UCLA

Spontaneous Human Combustion: Joe Nickell, technical writing instructor, University of Kentucky, Lexington

3:00-4:00 P.M.

Psychic Fraud: Patrick Riley, detective, Los Angeles Police Department

Astrology: Ivan Kelly, professor of psychology, University of Saskatchewan

4:00-5:00 P.M.

Open Forum: Informal question-and-answer session with members of the CSICOP Executive Council

Saturday Evening

(at the Pasadena Hilton International Ballroom)

5:30-7:00 P.M.: Cocktail Party (Cash Bar)

7:00-10:00 P.M.: AWARDS BANQUET

Chairman, Paul Kurtz

Featuring* PENN and TELLER, *Comedians

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MARTIN GARDNER

Notes of a Fringe-Watcher

The Anomalies of Chip Arp

We have watched the farther galaxies fleeing away from us, wild herds of panic horses—or a trick of distance deceived the prism. . . .

—Robinson Jeffers

IN HIS SPLENDID book *The Drama of the Universe* (1978) the late George Abell, an astronomer who served on the editorial board of this magazine, speculates what generates the enormous energies emitted by quasars (quasi-stellar sources). Quasars are almost surely the most distant known objects in the universe. Their gigantic redshifts indicate that some are moving outward at velocities close to 90 percent of the speed of light. They occupy positions believed to be very near the "edge" of the light barrier, a boundary beyond which nothing could ever be observed from our galaxy.

"All these ideas," writes Abell, referring to alternative theories about the nature of quasars, "and many more (except, probably, the right one), have been suggested. . . . But I must say, the situation isn't helped any by certain catalogs of crazy-looking objects. One nasty person who has given us such a catalog, and who keeps adding to it, is Halton C. Arp. I don't know what the 'C' stands for, but all his friends call him 'Chip.' He's in danger of losing all those friends, if he keeps up what he's doing now!

"Now mind you, I am kidding, because I am very fond of Chip Arp. In fact, we were graduate students at Caltech together. But in those years he was nice."

An astronomer at Hale Observatories, in California, Chip Arp is still adding to his collection of crazy objects, and still making sharp rapier jabs at his more orthodox colleagues. (Actual sword fencing, by the way, is one of his major hobbies.) Like Thomas Gold, the subject of this column two issues back, Arp is a competent, well-informed scientist who delights in the role of gadfly. His peculiar anomalies are quasars that seem to be connected by bridges of luminous gas but that have markedly different redshifts, or high-redshift quasars that appear joined to low-redshift galaxies. "Arpian objects" they are sometimes called. If such objects really are connected, they cast grave doubts on the establishment view that a redshift is an accurate indicator of a quasar's distance and receding speed.

Of course no one can be absolutely sure that the orthodox view is correct—in science you can't be certain of any-

thing—but powerful arguments support it. The redshift is a "Doppler" effect similar to changes in the pitch of sound from objects moving rapidly toward or away from you. Light from objects moving away has its wavelength shifted to the red side of the spectrum; light going in the opposite direction is blueshifted. The effect is strongly confirmed by the motions of nearby stars and galaxies for which there are other ways to estimate distances and velocities, but for quasars the redshift is the only way to gauge distances and speeds. Could the shift have causes other than outward motion?

One theory, for which there is not a shred of evidence, is the old "tired light" hypothesis of Fritz Zwicky. This proposes that, when light travels long distances through space, something not yet understood makes it shift toward the red. Very few astronomers support this conjecture, although it is periodically revived with new and exotic explanations of what causes the light to alter.

Another strongly discredited theory is that the quasars are indeed moving rapidly away from us but are objects ejected violently from our galaxy. This could give them huge redshifts, but allow them to be nearby rather than extremely far away. Such a "local theory" of quasars is held by a minority of astrophysicists who simply can't believe that quasars near the rim of the universe could generate enough energy to be as bright as they are.

If quasars are ejected from our galaxy, one would expect similar stellar objects to be blown out from other galaxies, and those moving toward us would be blueshifted. No blueshifted quasar has yet been seen. Proponents of the local theory argue that blueshifts move the spectrum into the ultraviolet, where the radiation is harder to detect than that shifted into the infrared. Maybe blueshifted quasars *are* out there. We just haven't found them.

A third conjecture, allowing quasars to be nearby, is that most of their redshifting is caused not by receding velocity but by what is called the "gravitational redshift" of relativity theory. Strong gravity fields jog light toward the red. Judging by closer stellar objects, gravitational redshifts are too weak to account for quasar redshifting even if there are massive black holes at their centers, as many cosmologists suspect. Arp's view is that nobody knows what quasars are or what causes their redshifts. He believes the quasars are nearby and that his anomalies prove that their redshifts are not proportional to their distances or velocities.

Arp's opponents, the majority of astrophysicists, think his peculiar objects with their "discordant redshifts" are nothing more than optical illusions. If you look long and hard enough at the heavens, they say, you can expect to find many spots where one quasar seems linked to another, or to a galaxy, when actually one object is millions of light-years in front of or behind the other. The situation is like searching for peculiar patterns in a table of random numbers. You are sure to find unusual patterns that, after you apply *a posteriori* statistics, seem highly unlikely. Arp and his supporters claim he has found more anomalies than chance can explain. Opponents insist that his statistics are faulty. If he is right, cosmology will be in a shambles.

As a science writer with only a dim grasp of astrophysics, I would bet against high odds that Arp is wrong. "The people who were antagonistic toward Arp in the past," said astronomer Wallace Sargent, "have been afraid that he might be right. They're not, for the most part, afraid anymore. He's like a pebble in your shoe. After a while you don't notice the irritation anymore."*

On the other hand, it has always been

*As quoted in "The Most Feared Astronomer on Earth: Halton C. Arp," by William Kaufmann III, *Science Digest*, July 1981.

hazardous to be certain about cosmological theories, and today may be no exception. If, for example, it is discovered that photons (carriers of light) have a slight rest mass, quasar redshifting could indicate high temperatures rather than high velocities. In addition, collisions of such photons with the black-body radiation that permeates the universe (a remnant of the primeval explosion) might also shift quasar light toward the red.

It has been said that cosmologists, more than most scientists, incline toward dogmatic rhetoric. Here, for instance, is Fred Hoyle defending his once-popular steady-state theory in the 1960 revision of *The Nature of the Universe:* "Is it likely that any astonishing developments are lying in wait for us? Is it possible that cosmology of 500 years hence will extend as far beyond our present beliefs as our cosmology goes beyond that of Newton? It may surprise you to hear that I doubt whether this will be so."

Five years later, it was Hoyle who was surprised. That was when two teams of New Jersey scientists, working independently, found the microwave radiation that can be plausibly explained only as a residue of the ancient fireball. It was Hoyle, incidentally, in the first edition of the same book, who invented the term "big bang." He intended it as a phrase of derision. "When we look at our own galaxy," he wrote, "there is not the smallest sign that such an explosion occurred."

Other famous cosmologists have been just as dogmatic as Hoyle—and just as mistaken—about their theories of the origin of the universe or the origin of our solar system. However, from my novice's seat, it now looks as if big-bang theory will last 500 years and that Arp's anomalies will prove to be just what his opponents say they are—perspective illusions. "Call halton eatwords," wrote James Joyce in *Finnegans Wake* (page 569). Let Abell have the final comment:

> It is always the *un*explained phenomena and the observations we *do not* understand that lead us to new insights about the nature of the physical world. Most of us strongly expect that when we know enough, we shall be able to understand quasars and other peculiar galaxies in terms of known laws of physics. But consider the delight of the scientist when he finds something really new, and you will realize why many of us, deep inside, hope *not*. •

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ROBERT SHEAFFER

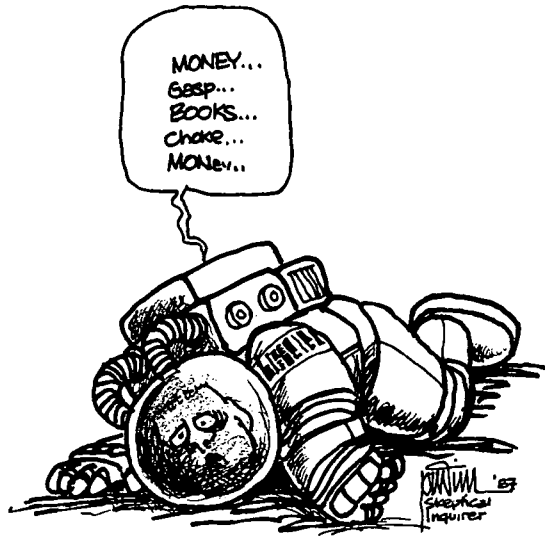
Psychic Vibrations

WHAT EVER happened to ancient astronauts? A dozen years ago (can it possibly be that long?), ancient astronauts, who supposedly came to earth with powers and abilities far beyond those of mortal men, were the hottest fad in para-dom. And leading the charge on behalf of the alleged prehistoric E.T.'s was Erich von Däniken, the Swiss writer and ex-con whose *Chariots of the Gods?* was selling millions of copies worldwide. Nowadays, hardly anyone seems to pay much attention to claims of ancient astronauts, with the exception of actress Shirley MacLaine, who during a recent trip to Peru managed to infuriate her Peruvian hosts by suggesting that their ancestors could not possibly have been smart enough to have built the magnificent ancient cities in that country and hence must have had extraterrestrial assistance.

In fact, so slow have things been that even Erich von Däniken is having a hard time getting his latest book, *The Day the Gods Arrived,* published in the United States. His publisher, Bantam Books, feels that there is "not enough interest in the field." So, von Däniken, seeking to rally his supporters behind him, has sent a letter to all remaining members of the Ancient Astronauts Society, whose number we are not privileged to know, but which must surely be far fewer than the readers of this publication, and may be almost as small as the membership of the Poughkeepsie/Fishkill Skeptics, which has yet to be founded. He asked each of them to write a letter to Mr. Alberto Vitale, president of Bantam Books, asking why there are no new von Däniken books being published. Five different texts are helpfully suggested, in case the letter-writer feels a bit tongue-tied. However, lest this letter-writing campaign backfire, von Däniken's computer urges: "Please . . . do *not* use all of these suggestions. One is enough. It would really be helpful, if you wrote some of your own thoughts and ideas." Readers of this publication who may have thoughts and ideas on the subject are likewise encouraged to share them with Mr. Vitale.

* * * * *

And while we're reminiscing, whatever became of Delphi Associates, the San Francisco–based group that claimed to have made a small fortune in the fall of 1982 by using "psychic powers" to trade silver futures? Delphi was jointly founded by Russell Targ (formerly of SRI Inter-



national, who along with Hal Puthoff became international celebrities by claiming to have scientifically authenticated the "psychic powers" of Uri Geller and others) and Keith "Blue" Harary, noted psychic experimenter and out-of-body traveler.

Delphi's claims of paranormal investment success achieved worldwide publicity owing to articles in numerous magazines and newspapers, including the *Wall Street Journal,* as well as being prominently (and uncritically) featured on a 1984 NOVA television episode. These claims landed Delphi a $10,000-a-month contract with Atari to develop what Targ termed "psychically enhanced video games." (Atari's subsequent massive layoffs and near-demise were apparently not foreseen by these oracles, although any experienced manager could have predicted such an outcome for a company that would spend so much money on so little substance.) Since Delphi claimed to have made profits of thousands of dollars in just a few months by exploiting Harary's paranormal talents, it is most perplexing that no further outrageous profits have been reported since that initial claim of success, especially since by now they should have been able, assuming reinvestment of profits, to accumulate practically all the money in the world, or at least a substantial fraction thereof. (The Securities and Exchange Commission's rules on "inside trading" apparently do not consider information received by psychics and clairvoyants as "inside information.")

Further compounding the mystery is the fact that Russ Targ has recently taken a full-time job in the research laboratory of a major Silicon Valley company, doing work in laser physics, the field in which he specialized before achieving worldwide fame as a parapsychologist. One wonders when, if ever, we will see NOVA (as well as various newspapers and magazines too numerous to mention) set the record straight on Delphi's dramatic failure to repeat its initial ebullient claims of paranormal investment success.

* * * * *

Who is Cedric Allingham and why is he writing those silly stories about flying saucers from Mars? During UFOlogy's heyday, in 1954, a book was published in the U.K. titled *Flying Saucers from*

Mars. Its author, one Cedric Allingham, related a typically implausible tale of meeting men from Mars. The problem is, nobody actually knows who Allingham is (or was); his publisher announced his death in 1956, but forwarded a letter to him thirty years later.

British researchers Christopher Allan and Steuart Campbell (a contributor to *SI*) suspected that the Allingham book might have been written as a lark by Patrick Moore, the well-known British popularizer of astronomy and debunker of saucer yarns. Allingham's publisher also published two of Moore's early books. Not only did there appear to be similarities between phrases and descriptions of astronomical phenomena used by Moore and "Allingham," but Moore claimed in one of his books to have once actually *met* Allingham, making him the only known person who had. A photograph of Allingham's telescope in his backyard looks remarkably like published photos of Moore's telescope and yard.

A letter recently sent by Allan and Campbell to Allingham in care of his publisher was in fact forwarded to journalist Peter Davies, who admitted his participation in the *Flying Saucers from Mars* hoax. Davies said his role was to rewrite the book in an attempt to disguise the author's style. He declined to say who the author was, but he admitted being an old friend of Patrick Moore. As for Moore, he refuses to comment on the matter. If Moore really *is* the author of *Flying Saucers from Mars,* as is suspected, then this is perhaps the funniest UFO hoax yet revealed, and there is no reason to keep such a good joke private any longer. •

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The Elusive Open Mind: Ten Years of Negative Research in Parapsychology

What does a psychologist who's had an extraordinary experience do? Sets up a research program to test for psi. The lessons are surprising.

Susan Blackmore

EVERYONE THINKS they are open-minded. Scientists in particular like to think they have open minds, but we know from psychology that this is just one of those attributes that people like to apply to themselves. We shouldn't perhaps have to worry about it at all, except that parapsychology forces one to ask, "Do I believe in this, do I disbelieve in this, or do I have an open mind?"

The research I have done during the past ten or twelve years serves as well as any other research to show up some of parapsychology's peculiar problems and even, perhaps, some possible solutions.

I became hooked on the subject when I first went up to Oxford to read physiology and psychology. I began running the Oxford University Society for Psychical Research (OUSPR), finding witches, druids, psychics, clairvoyants, and even a few real live psychical researchers to come to talk to us. We had Ouija board sessions, went exploring in graveyards, and did some experiments on ESP and psychokinesis (PK).

Susan Blackmore is with the Brain and Perception Laboratory, University of Bristol, Bristol, England. *This article is based on her presentation at the 1986 CSICOP conference at the University of Colorado in Boulder. Her book* Adventures of a Parapsychologist *has recently been published by Prometheus Books.*

". . . I had an experience that was to have a lasting effect on me—an out-of-body experience."

Within a few weeks I had not only learned a lot about the occult and the paranormal, but I had an experience that was to have a lasting effect on me—an out-of-body experience (OBE). It happened while I was wide awake, sitting talking to friends. It lasted about three hours and included everything from a typical "astral projection," complete with silver cord and duplicate body, to free-floating flying, and finally to a mystical experience.

It was clear to me that the doctrine of astral projection, with its astral bodies floating about on astral planes, was intellectually unsatisfactory. But to dismiss the experience as "just imagination" would be impossible without being dishonest about how it had felt at the time. It had felt quite real. Everything looked clear and vivid, and I was able to think and speak quite clearly.

You can imagine the intellectual conflict I experienced (and of course I had no idea it was only a prelude to far worse mental conflicts!). The psychologists and physiologists who were teaching me made quite different assumptions about human nature from those made by the people I met through the OUSPR. The latter, for the most part, assume that there is "another dimension" to man, that we can communicate directly mind to mind, that there are "other worlds" waiting to be explored in altered states of consciousness, and even that consciousness is separable from its physical home and might survive the death of its body. The conflict was a challenge to me and I conceived the objective (I think naively, rather than purely arrogantly) of proving my teachers wrong, or at least showing that psychologists were closed-minded in ignoring the most important of human potentials—the paranormal.

Even at that very early stage I made a crucial mistake—or a series of crucial and related mistakes. First, I assumed that all these odd and inexplicable things—ESP, PK, OBEs, mystical experiences, ghosts, poltergeists, and near-death experiences—were related and that one explanation would do for all. Second, I assumed that there had to be a paranormal explanation—that we were looking for psi. Third (and I don't know whether this was just cowardice or an attempt at being sensible for a change), rather than launching straight into what really interested me—the OBE—I thought it was more "scientific" to begin with psi. After all, there had been research done on ESP and PK and, though generally rejected, it had some basis in scientific research. It seemed far easier, and safer, to start there. I didn't notice what I was doing. I can only point it out with the benefit of hindsight. I just took psi to be the key to the mysteries and wanted to study parapsychology.

The first thing I did was to develop my own theory of psi. This theory involved the notion that psi and memory are aspects of the same process,

that memory is a specific instance of the more general process of ESP. Eventually I got a place at Surrey University to do a Ph.D., and it was then that I set about testing my theory.

While I was at Surrey I was lucky enough to be given the chance to teach a parapsychology class. It attracted more than a hundred students, so I had plenty of subjects for my experiments. I began three kinds of tests. First, I predicted a positive correlation between ESP and memory. That is, if memory and ESP are aspects of the same process, then the same people should be good at both of them. I did many tests of this kind (Blackmore 1980a). Second, I predicted that the best target materials for ESP should not be those that are easy to perceive, but those that are easy to remember. I did a series of experiments with different target materials (Blackmore 1981a). Third, I predicted that the errors and confusions made in ESP should more closely resemble those made in memory than those made in perception. I had high hopes for this method since the study of errors has always been so useful in psychology, for example, in the study of visual illusions. I also did many experiments to test this (Blackmore 1981b). However, the only noteworthy thing about all of the results was the number that were not significant.

After a long series of experiments I had no replicable findings and only a large collection of negative results. Clearly they could not answer my original questions, nor test my special theory. Some of you may already be protesting: What an idiot. Why didn't she just give up and do something useful instead? But I would have responded: *This* could be useful! If ESP exists, it could be one of the most important findings for science; and in any case you can never tell in advance what research will be useful in the end. You may also be thinking, as many people said at the time: "Oh but this is just what you'd expect. She has only shown that there is no psi." But of course I hadn't done that, and couldn't do that. No amount of negative results can prove the nonexistence of psi. Psi might always be right around the next corner, and there were plenty of corners to look around.

"After a long series of experiments I had no replicable findings and only a large collection of negative results."

There were also plenty of parapsychologists eager to suggest corners I had not yet turned and reasons why my experiments had not worked. And I was eager to carry on the search. Some said it might be the subjects; students are notoriously not the best ones. So, instead of testing my class, I tested people who came to me with claims of special powers. I tried to design experiments that would test what they claimed to be able to do and that would allow me to impose sufficient controls. In some ways this upset me more than anything, because I met lots of genuine and well-meaning people who were convinced they could communicate by telepathy, or find underground pipes or hidden

water, until they tried to do it under conditions that ruled out normal sensory information. Then they, and I, were always disappointed.

"There were plenty of parapsychologists eager to suggest corners I had not yet turned and reasons my experiments had not worked."

Then I tried using young children as subjects. At that time, Ernesto Spinelli was getting outstandingly good results with preschool children in ESP tests (Spinelli 1983). So I set about designing experiments to use a method similar to his (though not a direct replication) to test my memory theory. It was much harder work than the previous experiments, but much more fun. The children were three- to five-year-olds in playgroups, and they thoroughly entered into the whole idea, being convinced they could transmit pictures to one another. But the results were quite clear. The proportion that were "nonsignificant" was as high as before. The overall results were non-significant and so were the correlations with age (Blackmore 1980b).

Why? Spinelli had many suggestions. It could have been that I used colored pictures, while his were black and white; or that the sweets I used as a reward (based on someone else's previously successful experiments) were too well liked by the children and were disruptive; or that I simply didn't have the right personality and rapport with the children. I could only say that I seemed to get on well with the children, but perhaps this was not well enough.

Another suggestion was that the problem was not the subjects themselves, but the state of mind they were in during the experiments. At that time, the ganzfeld experiments were the "latest thing," and the results from Carl Sargent (1980) at Cambridge, and Chuck Honorton (1977) at Princeton, seemed impressive. So I set about doing a ganzfeld study. My subjects each had half of a ping-pong ball covering each eye, lay on a reclining chair, and heard only white noise fed through headphones. I wrote down everything they said. Then they had to look at four pictures and choose which one they thought the agent had been looking at.

I had for some months led an imagery training group, in which we practiced relaxation, guided imagery, and many imagery tasks adapted from Buddhist training techniques. For my ganzfeld study I chose ten test subjects from this group and ten control subjects.

This study taught me a lot. Being in ganzfeld is in itself an interesting experience. Images come pouring in, and it is tempting to imagine that you are picking them up from somewhere outside of yourself. I also had one very impressive experience in which I was subject and my brother was agent. I "saw" people fishing, lakes, mountains, and swiss chalets, and when I saw the targets I picked the correct one right away. It was an amazingly close hit. It set me to wondering whether I had at last found the key! However, in the

course of the experiment I saw many equally amazing correspondences, but to the wrong pictures. My remarkable hit rapidly disappeared among the chance scores.

This should have taught me something important, something I should have known all along; that is, one should not rely on subjective estimations of probability (see Blackmore and Troscianko 1985). One should rely only on the statistics, and they were telling me that there was nothing there. Of course I tried it again with my brother, but the second time it did not work. Overall the results were close to chance expectation.

Why did this study also fail? I had used trained subjects in psi-conducive conditions and a method others had found successful. The ultimate suggestion of most parapsychologists was that it was an experimenter effect—more than that, it was a psi-mediated experimenter effect. That is, either I was using my own negative psi or I had some kind of personality defect, or defect in belief, that suppressed the psi of other people. I was a psi-inhibitory experimenter, so that whatever I did I would always get negative results. I began to get the feeling that I had some creeping sickness. I was a failure, a reject; there was something in me that suppressed the true spiritual nature of other people. I tried not to let it upset me, but I must admit that there is something terribly unflattering about being labeled "psi-inhibitory"!

"I was told I didn't get results because I didn't believe strongly enough in psi, because I didn't have an open mind."

Well, what could I do about it? It is not entirely an untestable idea. But Sargent had already tested the personalities of successful and unsuccessful experimeters and found the successful ones to be extroverted, confident, non-neurotic, and so on. In fact I fitted the description quite well—except for my results.

The other key to my failures seemed to be belief. I was told that I didn't get results because I didn't believe strongly enough in psi, because I didn't have an open mind! But what could I do about that? I couldn't just change my beliefs overnight or test ten subjects while believing and another ten while not! I argued that in the beginning I had believed in psi and still had got no results, but I couldn't prove this against the counter-argument that I had never *really* believed at all.

However, I did have an idea. There were still things in which I did believe. I could test the Tarot. In my preoccupation with everything occult, I had been reading Tarot cards for about eight or nine years. They really did seem to work. People told me that I could accurately describe them using the cards, and this was, naturally, gratifying. I even thought it might have a paranormal basis. So I set about testing the cards, doing readings for ten people, keeping the procedure as close as possible to a normal Tarot reading,

but isolating myself, as the reader, from the subjects. They then had to rank all ten readings to see whether they picked their own more often than chance would predict (Blackmore 1983).

It worked! The results were actually significant. You can imagine my excitement—perhaps I had at last found something. Perhaps there was no psi to be found in the standard laboratory experiments, but something paranormal could appear when the conditions were closer to real life. But then I talked to Carl Sargent. He pointed out that all my subjects knew one another, and if they knew one another their ratings and rankings could not be independent. So I had violated an assumption of the statistical test I was using.

This seemed so trivial. Their knowing one another could not help them pick the right reading, could it? No it couldn't; but this meant that the estimate of probability was inaccurate—and, after all, the results were only marginally significant. So I repeated the experiment twice more with subjects who did not know one another. I expect you can predict the results I obtained—entirely nonsignificant.

You may choose to interpret these results in different ways. Some parapsychologists have claimed that the first experiment found genuine psi and that the later ones didn't summon the same attitude, the same novelty, the same enthusiasm, that made psi possible—or even that psi itself doesn't like being replicated. But I think I had finally reached a stage where I no longer felt it was worth pursuing such arguments. I chose this point to say: "I think that, however many more experiments I do on psi, I am probably not going to find it."

Now we finally come to the question: "What do these negative results tell us?" Of course the one thing they do not tell us is that psi does not exist. However long I went on looking for psi and not finding it they could not tell us that. But I found myself simply not believing in psi anymore. I really had become a disbeliever. Like one of those doors with a heavy spring that keeps it closed, my mind seemed to have changed from closed belief to closed disbelief.

But either way I suffered. There was mental conflict whether I believed or disbelieved. I had many questions. One was this: How far could I generalize these negative results? The situation was the converse of the normal situation in science when one gets positive results and has to ask how far they can be generalized. Here I had to ask whether my negative results applied only to those experiments carried out by me, at those particular times, or whether they applied to the whole of parapsychology. There is no obvious answer to that question. If one had replicability one could answer the question as one does in other areas of science. But without replicability it is impossible.

The next question was: How could I weigh my own results against the results of other people, bearing in mind that mine tended to be negative ones while everyone else's seemed to be positive ones? I had to find some kind of balance here. At one extreme I could not just believe my own results and ignore everyone else's. That would make science impossible. Science cannot

"I could not just believe my own results and ignore everyone else's. . . . I could not believe everyone else's results and ignore my own."

operate unless people generally believe other people's results. Science is, and has to be, a collective enterprise.

At the other extreme I could not believe everyone else's results and ignore my own. That would be even more pointless. There would have been no point in all those years of experiments if I didn't take my own results seriously. Indeed, it is a fundamental principle in science that one has to take notice of the results one finds.

So there is no right answer to how to weigh them up. And these problems are only aspects of the basic dilemma of parapsychology, which is whether to believe or disbelieve in the existence of psi. Either way, I suggest, one meets conflict.

In the believer's position one is saying: "I believe there is something negatively defined, defined as communication without the use of the recognized senses, or action without the use of the muscles of the body. I have faith that future experiments will find this thing, even though so far they have failed to produce a replicable effect." If one takes this position, then one not only has to accept the open-ended nature of the search but also has to face up to the mounting negative results.

But what about the disbeliever's position? The disbeliever is only saying: "I do *not* believe there is this negatively defined thing. I do not believe the search will be successful. I have faith that all experiments with positive results could be successfully debunked." So the disbeliever is in a kind of mirror-image of the believer's position. But of course one can never debunk all the experiments, and there will always be more in the future. So the search is equally open-ended. And the disbeliever has to take notice of those positive results. I am thinking particularly of the results of Carl Sargent, Charles Honorton, Helmut Schmidt, and Robert Jahn. I suggest that if we think these can easily be dismissed then we are only deluding ourselves. One cannot offer simplistic counterexplanations and throw all these results away. I am not saying that these results may not, in the future, succumb to some normal explanation; they may well do so. But at the moment we do not have such an explanation.

Whether you are a believer or a disbeliever you will suffer mental conflict and anguish. So what is the solution? Easy, isn't it? Have an open mind. But human beings are not built to have open minds. If they try to have open minds they experience *cognitive dissonance.* Leon Festinger (1957) first used this term. He argued that people strive to make their beliefs and actions consistent and when there is inconsistency they experience this unpleasant state of "cognitive dissonance," and they then use lots of ploys to reduce it. I

have to admit I have become rather familiar with some of them.

First there is premature closure. You can just pick one theory and stick to it against all odds. But I could not do that after all those years. What I could do was only slightly more subtle; that is, I could prefer one theory and ignore the evidence that goes against it. In this way the believer can dismiss negative results by using all the old arguments: The time, the place, the emotional state, or the "vibes" weren't right. Or the disbeliever can refuse to look at the positive results. You may think I wouldn't refuse, but I have to admit that when the *Journal of Parapsychology* arrives with reports of Helmut Schmidt's positive findings I begin to feel uncomfortable and am quite apt to put it away "to read tomorrow."

Alternatively one can jump on a simple counterexplanation, such as "It's all fraud and delusion." Well, maybe it is, but that too creates dissonance of its own. To go around thinking that everyone is cheating, or deluding themselves, can turn one into a permanently suspicious and miserable sort of person, and it can damage one's self-esteem. Suspecting that some effect is fraudulent and tracking that down systematically is one thing, but approaching everything one hears about as though it must be fraud is destructive.

Then there are other cheap ploys. You can decrease the perceived attractiveness of the opposition. The believer can find it easy to put down one famous critic as a dried-up old professor with no real contact with the field anymore, or a more recent one as having shifty eyes and too bushy a beard! Or the disbeliever can dismiss research on the grounds that all parapsychologists are Scientologists, or are too committed to religious beliefs, or are too dreamy-eyed and vague to be doing "real science." But none of this will really wash. And most of us know it won't. Nevertheless, we go on doing it because it is so very hard to have an open mind.

I have said rather a lot about what negative results do not tell us, but is there anything they do tell us? I think we are now in a position to see that there is. I suggest that, wherever you start in parapsychology, if you base your research on the psi hypothesis then you will be forced to do ever more and more restricted research, to back up into ever less and less testable positions, and to produce ever more feeble and flimsy buttresses to hold your theory together. In the end, whatever the questions you started with, you are forced to ask more and more boring questions until there is only one question left: Does psi exist? That question, I submit, is unanswerable.

This process is not restricted to those who get negative results. Helmut Schmidt is among the best researchers in parapsychology, and he has been forced to ask the question "Does psi exist?" Charles Honorton is another example. He is working on fraud-proof, fully automated procedures, even though he might prefer, as do most people in parapsychology, to do process-oriented research, as I did when I started with my question "Is ESP like memory?"

I think that is the problem with parapsychology, and it is a problem that starts from the very hypothesis of psi. The structure and definitions of para-

psychology are to blame. The negative definition of psi, the hundred years of bolstering failing theories, and the powerful will to find something are at fault. They not only force us to ask, "Does psi exist?" but force us to answer in terms of belief. Where there is no rational and convincing answer, belief takes over, and that is why there are two sides, and such misunderstanding.

"The whole history of parapsychology looks like a string of wrong questions."

Here, it seems to me, lies the crux. All those negative results teach us only one thing, that we have been asking the wrong question. And the whole history of parapsychology looks like a string of wrong questions. Parapsychology is, if it is based on the psi hypothesis, a magnificent failure; not because psi doesn't exist, but because it asks unanswerable questions.

An entirely different aspect of my research was prompted by my personal out-of-body experience. I never entirely forgot it. I went on wanting to understand it and eventually tried to tackle it directly.

The first question I asked was the obvious one: "Does anything leave the body in an OBE?" This question may seem close to the unanswerable "Does psi exist?" but I think it is different enough, or perhaps I was just more ruthless in trying to answer it. From experiments of my own, and from reading the literature, I concluded that we do have an answer. And it is "No." You may have heard about an isolated incident of an OBE when someone correctly read a five-digit number (Tart 1968), or when a cat responded to its owner's out-of-body presence (Morris et al. 1978), but I prefer to look at the whole body of evidence (see Blackmore 1982). I concluded that these were unreplicable and that in general we have enough evidence to answer that there is no real evidence for psi in OBEs, there is no evidence of anything leaving the body, and there is no evidence of effects caused by out-of-body persons.

The next question I asked was "Why does the OBE seem so real?" To someone who has not experienced an OBE this might seem a silly starting point, but those of you who have will probably understand why I asked it. That then set me to ask, "Why does anything seem real?" Here I provided myself an answer that seemed to account for the OBE (Blackmore 1984).

Very briefly, I argued that the cognitive system cannot make its decision about what is "real" or "out there" at the low level of chunks of input. Rather, it makes its decisions at the higher level of global models of the world. That is, it constructs models of the world, and chooses one, and only one, as representing "the world out there."

I next had to ask, "Can this decision go wrong?" And the answer is obviously "Yes." When there is inadequate input—damage to the system, drugs, trauma, or any of the many things that can precipitate OBEs—then it might. But what would happen if it goes wrong, the system loses contact with

reality? I would say that a sensible strategy would be to try to replace the lost input model with the next best approximation—one built from memory. And we know a lot about memory models. For example, as Ronald Siegel (1977) has pointed out, they are often built on a bird's-eye view. We know they are schematized, simplified, and often plain wrong. Indeed, they are just like the OBE world.

I proposed that the OBE comes about very simply when the system loses input control and replaces its normal "model of reality" with one constructed from memory. It seems real because it is the best model the system has at the time, and it is therefore chosen to represent "out there."

This answered a lot of questions about the OBE; especially about the phenomenology of the experience. It also led to some predictions I have successfully tested. For example, if the OBE occurs when the normal model of reality is replaced by a bird's-eye view constructed from memory, then the people who have OBEs should be better able to use such views in memory and in imagery. In several experiments I found that OBEers were better at switching viewpoints, were especially good at imagining scenes from a position above their heads, and were more likely to recall dreams in a bird's-eye perspective. I actually had some positive results at last (Blackmore 1986a)!

This theory also led to a new approach to altered states of consciousness in general. To that persistent question "What is altered in an altered state of consciousness?" I could now answer that a person's "model of reality" is altered. I could look at changes induced by meditation, drugs, hypnosis, or a mystical experience, in terms of the changing models of reality (Blackmore 1986b). The OBE could then be seen as only one of a variety of experiences that become possible when the input-driven model of reality is lost.

Interestingly, this theory treats the OBE as a kind of error of reality modeling. And so once again the error can be used to throw light on the normal process at work. But I was only able to come back to this insight once I had abandoned looking for psi. It wasn't that I had rejected the possibility of psi, I had simply ignored it.

"I propose that the OBE comes about when the cognitive system loses input control and replaces its normal 'mode of reality' with one constructed from memory."

I mention my OBE research only to contrast it with my previous work based on psi. In my early work, starting from the psi hypothesis, I was forced to ask, "Does psi exist?" In this research I never had to ask it. The other difference is that I no longer had to worry about having an open mind. That makes me wonder what it is like in other sciences. Of course it is always important to have a potentially open mind. If one's results show that one's hypothesis is wrong, then one has to be prepared to change it; but that need

not happen very often—at least if one's hypotheses are any good it shouldn't. One doesn't have to have a permanent open mind. And so it was with the OBE research—and what a relief!

I can conclude that all my negative results did teach me something. Or am I perhaps only trying to get my 50-cents worth? A few years ago I read an article in the *British Psychological Society Bulletin* about the "Royal Nonesuch of Parapsychology." The author, H. B. Gibson (1979), described Mark Twain's wonderful story of cognitive dissonance, about the show that never was. Many people were lured into paying 50 cents to see a nonexistent show, but instead of decrying the fraud they went out and persuaded others to see it and pay their 50 cents too. Gibson was reminded of this tale, he said, by a conference paper given by a woman who had spent two years in fruitless research on parapsychology. He suggested that parapsychology is only kept going by the "very human tendency to try to get one's 50-cents worth after one has been misled . . . by an unkind fate which has led one into an immense expense of effort in a blind alley."

I fought back in print (Blackmore 1979), arguing that I was not just trying to get my 50-cents worth, that I was after the truth and an understanding of the Nature of Life, the Universe, and Everything. But the problem is that it is very hard to understand the nature of life, the universe, and everything, if you start with the psi hypothesis.

In the end I think my negative results told me that the psi hypothesis leads only to unrepeatability (Blackmore 1985). It forces us to ask ever more boring questions, culminating in the question "Does psi exist?" and to that question there is no obviously right answer. Where there is no right answer, we are in ignorance; and, where we are in ignorance, we should do only one thing—have an open mind. But that is too difficult. After all these years of research, I can only conclude that I don't know which is more elusive—psi or an open mind.

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Does Astrology Need to Be True? Part 2: The Answer Is No

New evidence shows that astrologers are seeing faces in clouds. And a famous legal case is demystified.

Geoffrey Dean

In Part 1 we saw that astrologers believe in the real thing (serious astrology) because it works, i.e., is helpful. But is it true? More to the point, does it need to be true? Four independent surveys of published predictions found no evidence that astrologers can predict better than guessing. Seven studies of chart interpretations found no evidence that subjects can discriminate between right and wrong charts, suggesting that the perceived validity of astrology is an illusion. However, the picture is blurred, because chart interpretations tend to be wordy and rambling, making judgment difficult. So what happens when especially concise interpretations are used to make judgment easy? I decided to find out.

MY EXPERIMENT consisted of having each of 22 subjects rate an extremely concise interpretation of his/her astrological chart. The subjects (5 male, 17 female, mean age 31) were recruited through a local occult bookstore and ads in an occult magazine and were previously unknown to me. Each interpretation was based solely on interplanetary aspects (specified angular separations), because these generally have clear

Geoffrey Dean, a former CSIRO research scientist and currently a technical editor with Australia's major publisher of technical documentation, has been actively investigating astrological claims for the past 15 years.

meanings, can be weighted in strength according to exactness, and are considered by many astrologers to be the most important factors in the chart. For example, the eminent U.S. astrologer Rob Hand (1981) says, "They usually speak the loudest and yield the most reliable results." The effect of the other chart factors is discussed later.

Each interpretation consisted of a list of the closest aspects (typically 10 to 12 per chart), their exactness (range 0 to 5 degrees), their individual meanings expressed as adjectives or short statements (average 22 items per chart), and their opposite meanings (average 18 items per chart). For example, the meanings for Mars conjunct Uranus were as follows:

Meaning: impatient, mind of own, disruptive	(3 items)
Opposite: patient, easily led, not disruptive	(3 items)

The strength of these indications would then be strong, average, or weak, depending upon the exactness. The strength was not quantified; instead, the subject made his/her own estimate of the exactness, with verbal guidance from me. Obviously a subject who could be both *x* and *not x* would agree with anything the chart said about *x,* thus inflating the apparent accuracy, so opposite meanings were included to avoid this problem. The meanings and opposites were labeled so that the subject knew which was which.

The subjects were led to believe that the chart interpretations were authentic. In fact, only half the subjects received interpretations based on their actual charts. The rest received interpretations based on what I call "reversed charts." A reversed chart is one made to be as opposite to the actual chart as possible but with the same sun-sign to avoid suspicion. Thus, if the actual chart contained sun square Mars (= impetuous), the planets in the reversed chart would be juggled to give sun trine Saturn (= cautious). In this way extroverted indications were substituted for introverted, stable for unstable, tough for tender, ability for inability, and so on. The use of reversed charts is preferable to using actual charts with reversed interpretations because it allows the reader (in this case, me) to proceed normally without the need for pretense —an important consideration in a face-to-face situation. Some charts are too ambiguous to be adequately reversed; such cases were not included among the 22 subjects.

The subjects came separately for their consultations. I gave each subject a birth chart and written interpretation, explained what the chart symbols meant, and stressed the need to test the chart carefully before its indications could be accepted (this justified the next bit). The subject then rated on a 3-point scale (correct, uncertain, incorrect) each item in the interpretation, rating it as correct only if both meaning and strength were correct. This made the test as severe as possible. When finished, the subject carefully reviewed the ratings as a whole to resolve (1) any uncertainties, and (2) any conflict between one part of the interpretation and another (this accommodated the dictum that astrological factors cannot be judged in isolation). Most subjects

changed nothing. Each session was unhurried and occupied one to two hours. All subjects found the rating procedure to be simple and straightforward.

In this test the meanings were made as clear and concise as possible, and half the charts were made as wrong as possible. According to astrology the wrong charts should have stood out a mile. But the results (Table 1) show they were rated just as highly as right charts. In fact the results were so consistent and clear-cut that plans for further tests (which required a full day's work for each subject) were abandoned. However, I did perform a couple of similar tests in which two female subjects (known to each other but not to me) attended together and rated supposedly authentic interpretations that had in fact been switched. The results were the same: The subjects agreed with what seemed to be theirs (but were actually not theirs), and disagreed with what seemed to be not theirs (but were actually theirs). Moreover each subject agreed with the other's assessment.

However, before we can believe these results, we have to be sure that they cannot be explained by other chart factors, such as signs and houses, or by subjects preferring desirable descriptions (generous, serious) to undesirable ones (extravagant, grim). This is shown to be the case in Table 2. We also have to be sure that my personal presence did not bias the subjects' ratings. Fortunately this can be checked against an earlier published study of mine involving similar ratings done by mail and therefore free from such bias (Dean and Mather 1977, p. 39). In this study the average hit rate indicated by 44 subjects was 95 percent, or almost exactly the same as in the present study. This shows that any bias is not appreciable. So what do these results tell us?

TABLE 1

Can Subjects Tell Authentic Charts from Reversed Charts?

Charts	Number of items rated by 11 subjects	Number of hits*	Hits %	Range %
Authentic	261 meanings	250	96	90-100
	213 opposites	25	12	0-37
Reversed	214 meanings	207	97	90-100
	186 opposites	29	16	6-22

*Item was a hit if correct and a miss if uncertain or incorrect.

Answer: No. Subjects rated reversed charts (whose astrological indications could not have been more wrong) just as highly as authentic charts.

Reversed Charts and Cognitive Dissonance

The subjects clearly believed that their charts provided true descriptions of themselves even when, according to astrology, the descriptions could not have been more wrong. This finding is consistent with the results of previous

studies (see Table 1 in Part 1) and of the German psychologist and astrologer Peter Niehenke (1984). Niehenke gave 3,150 German subjects a 500-item questionnaire designed to test astrological claims, including aspect interpretations. The results were completely negative; for example, subjects with as many as four Saturn aspects (which are supposed to indicate heavy responsibility and depression) felt no more depressed than those with no Saturn aspects.

Similar results were obtained by Neher (1980) in small-scale studies of numerology, palmistry, Tarot, and the I-Ching, by Dlhopolsky (1983) in a small-scale study of numerology, and by Blackmore (1983) in tests of Tarot interpretations involving 29 subjects. In every study the subjects were unable to pick the right interpretation at better than chance level. Similarly, Hyman (1977, p. 27) found that palmistry was just as successful when the interpretation was the opposite of what the hand indicated. I myself have given astrologers a chart that was supposedly mine, but was actually that of somebody quite different from me, and their interpretations always fitted me perfectly.

But why should subjects see the birth chart (whether right or wrong) as being valid? Possible explanations are surprisingly numerous (Table 3). Some, like the Barnum effect (Dickson and Kelly 1985), where people accept vague statements as being specific for them when in fact they apply to everybody, are well known. Others, like selective memory (Russell and Jones 1980), the "Dr. Fox effect" (Naftulin et al. 1973), and hindsight bias (Marks and Kammann 1980), are less well known but can be remarkably potent. So when Rosenblum (1983, pp. 3-4), in the quotation cited in Part 1, saw pointedly specific meaning in what the astrologer said, we cannot conclude that there is necessarily something in astrology.

Most studies of actual interpretations have concentrated on generality (Barnum effect) and social desirability. For example Tyson (1984) found that the acceptance of chart interpretations prepared by a professional astrologer increased with their desirability; and Blackmore (1983) found that the acceptance of her Tarot interpretations increased with their generality and desirability, the correlation being about 0.3 in each case.

The mix of factors will of course vary with the astrologer. Thus Grange (1982) tested a professional astrologer whose interpretations happened to be clear and specific ("You have a good imagination"). They were judged by 54 subjects to be less accurate than Barnum and graphological statements (which were equally general), which in turn were judged to be less accurate than statements based on responses to the Eysenck Personality Questionnaire (which were necessarily specific and accurate). This shows that specific chart interpretations can be so wrong that the astrologer would be hard pressed to survive without support from the factors in Table 3.

In the present study, factors like generality and desirability do not apply. Hence the most likely explanation seems to be cognitive dissonance, or the need to justify our decisions and thus reduce any conflict (dissonance) between our thoughts and actions. The subjects were interested in astrology and prob-

ably believed in it, so they were motivated to avoid the pain of having their beliefs shattered. The interpretation test therefore became a search (albeit unconscious) for personal attributes to confirm their belief. Given the variability of human nature (we have all been everything at some time or another) the search could hardly fail.

TABLE 2
Some Individual Ratings of Aspect Interpretations

AUTHENTIC CHART

Subject agreed with this (= meaning of aspect actually present)	And disagreed with this (= meaning opposite to aspect actually present)	Aspect actually present*
Self-willed, pig-headed, tense	Calm, diplomatic, not tense	Su-Ur
Imprudent, extreme, restless	Restrained, not restless	Mo-Ju
Erratic, lacks confidence	Calm, confident	Mo-Ur
Confused, overly imaginative	Methodical, not imaginative	Me-Ne
Active, overscattered	Patient, persistent	Ma-Ju
Irritable, disruptive	Even, not disruptive	Ma-Ur
Forceful, overdoes things	Moderate, not forceful	Ma-Pl

*All are hard aspects and all are exact within 3 degrees. So according to astrology their effect should be strong.

REVERSED CHART

Subject agreed with this (= meaning of aspect supposedly present)	And disagreed with this (= meaning of aspect actually present)	Aspect actually present*
Well-directed, organized	Impetuous, overactive, scattered	Su-Ma
Considerate, self-effacing	Forceful, self-centered	Su-Pl
Mind separate from feelings	Mind linked to feelings	Mo-Me
Emotionally reserved, calm	Outgoing, moody	Mo-Ju
Restless mind, innovative	Methodical mind, cautious	Me-Sa
Steady mind, overcautious	Restless mind, scattered	Me-Ur
Cautious, well-directed	Impulsive, scattered	Ma-Ju

*All have no contrary indications by sign, house, or aspect elsewhere in the chart. All except Mo-Me are hard aspects and most are exact within 2 degrees. So according to astrology their effect should be extremely strong.

The interpretations are verbatim but have been condensed where necessary to fit the space. The upper examples show that *unpleasant* interpretations can be accepted, suggesting that belief in astrology can be stronger than social desirability. The lower examples show that unambiguously *wrong* interpretations can be accepted, suggesting that the belief itself can be stronger than any astrological effect.

This conclusion is supported by the results of Kallai (1985), who asked 101 male and female subjects aged 15 to 16 to judge the agreement between four supposedly astrological predictions and entries in a diary. Each prediction consisted of four statements, such as "You'll become more popular this week." The diary contained typically seven entries per prediction and was written so that one statement was confirmed ("I appeared on TV"), one was half-confirmed, one was disproved, and one was not referred to. The predictions were rated successful more often by believers in astrology than by nonbelievers, showing that what you believe affects what you see. Further striking but nonastrological examples are given by Marks and Kammann (1980).

If what you believe affects what you see, what happened before you believed what you believe? In other words, how do people come to believe in astrology?

How Does Belief in Astrology Arise?

For most people belief in astrology probably arises the same way: We hear or read what our sun-sign is supposed to mean, compare it with what we see in ourselves, and proceed from there. Let us look at what happens by summarizing in a single adjective the meaning of each sun-sign from Aries through Pisces, as follows—*assertive, possessive, changeable, sensitive, creative, critical, harmonious, secretive, adventurous, cautious, detached, intuitive.* Because we are interested only in our own sign, we fail to notice what astrologers aren't telling us, namely, that these traits are universal. Everybody behaves in each of these ways at various times; so, no matter what your sign is, it will agree with a trait you already possess. Lo! Astrology works—and you have started on the road to belief.

But there is more down this road than the universal validity of sun signs. Suppose astrology says that a person is extroverted, and we test this by asking the person questions. Since introverts occasionally do extroverted things, and vice versa, asking questions about instances of extroverted behavior ("Do you go to parties?") will necessarily produce extroverted answers that confirm astrology. Conversely, introverted questions ("Do you read books?") will necessarily produce introverted answers that disconfirm astrology. In other words the slant of the question can determine the outcome regardless of reality. So when testing astrology, what kind of questions do we tend to choose?

Glick and Snyder (1986) made an ingenious study to find out. They asked 12 believers and 14 skeptics to each test the validity of a brief chart interpretation (which indicated that the subject was highly extroverted) by asking the subject 12 questions chosen from a list of 11 confirmatory (extroverted) questions, 10 disconfirmatory (introverted) questions, and 5 neutral questions. The subject was in fact a confederate who gave predetermined answers matching the slant of the questions. Both believers and skeptics chose on the average just over 7 confirmatory questions, 3 disconfirmatory questions, and

TABLE 3

Twenty Ways to Convince Clients that Astrology Works

Principle	Factor	How it works.
Cues	Cold reading.	Let body language be your guide.
Disregard for reality	Illusory validity.	Sound argument yes, sound data no.
	Procrustean effect.	Force your client to fit the chart.
	Regression effects.	Winter doesn't last forever.
	Selective memory.	Remember only the hits.
Faith	Predisposition.	Preach to the converted.
	Placebo effect.	It does us good if we think it does.
Generality	Barnum effect.	Statement has something for everybody.
	Situation dependence.	Everybody has something for statement.
Gratification	Client misfortune.	The power of positive thinking.
	Rapport.	Closeness is its own reward.
Invention	Non-falsifiability.	Safety in numbers.
Packaging	Dr. Fox effect.	Blind them with science and humor.
	Psychosocial effects.	The importance of first impressions.
	Social desirability.	I'm firm, you're obstinate, he's —.
Self-fulfilling prophecies	Hindsight bias.	Once seen, the fit seems inevitable.
	Projection effects.	Find meaning where none exists.
	Self-attribution.	Role-play your birth chart.
Self-justification	Charging a fee.	The best things in life are not free.
	Cognitive dissonance.	Reduce conflict—see what you believe.

This table shows that there are many nonastrological reasons why clients should be satisfied by an astrological consultation, none of which require that astrology be true. But if clients are going to be satisfied with the product offered, then astrologers can hardly fail to believe in astrology. In this way a vicious circle of reinforcement is established whereby astrologers and their clients become more and more persuaded that astrology works. An astrologer typically spends years learning to read charts and thus has ample chance to respond to such reinforcement.

less than 2 neutral questions. In other words, *regardless of their stake in the outcome,* they tended to test the interpretation with questions that were bound to confirm it. This is consistent with the results of research into hypothesis-testing strategies in general (Nisbett and Ross 1980). But the surprises didn't end there.

For skeptics, the greater the number of confirmatory questions they asked (which of course increased the amount of confirmatory information they received), the more accurate they rated the chart interpretation, the correlation being an impressive 0.75—in fact two skeptics gave higher ratings than any believer. But for believers there was no correlation. All of them rated the interpretation as accurate or mostly accurate, regardless of the number of

confirmatory questions asked, showing that their rating bore little or no relation to the information received.

Russell and Jones (1980) observed similar results for belief in ESP among 50 college students divided equally into believers and skeptics. For skeptics, about 90 percent accurately remembered an article on ESP regardless of whether it was favorable or unfavorable. For believers, 100 percent accurately remembered the favorable article but less than 40 percent accurately remembered the unfavorable article; 16 percent actually remembered it as favorable. The believers who read the unfavorable article were far more upset than the skeptics who read the favorable article.

So it seems that belief in astrology arises because (1) astrological interpretations tend to be universally valid, and (2) we tend to test an interpretation with strategies that are bound to confirm it. If one is basically a skeptic, one's belief will be modified by subsequent evidence. If one is basically a believer, one's belief will persist because apparently positive evidence (as in Table 3) will be remembered, whereas negative evidence (like this article) will be ignored. On this basis, regardless of the evidence, astrology is not going to go away.

Astrology and Human Inference

It would be wrong to conclude that the apparent validity of an astrological consultation (Table 3) is due to nothing more than simple-minded gullibility. As Hyman (1981) and Connor (1984) point out, words and sentences do not exist like chunks of rock but have to be interpreted before they mean anything. Thus the message received by the client is determined by his previous programming, that is, by the experiences and expectations he draws on to give it meaning. Even with a transcript you can never experience the interpretation the way the client did—what seems facile to you ("You have problems with money") may be deeply meaningful to the client. So no description given by me can possibly recreate what a chart interpretation feels like; for this you need to visit a good astrologer.

The point I am making is that, far from exemplifying gullibility, the factors in Table 3 mostly reflect the very human ways in which we cope with the world. In other words, fundamental to our understanding of astrology (and anything else for that matter) is the problem of human inference, namely, the ability of human beings to correctly judge what is going on. Because our everyday judgment is so successful most of the time, it never occurs to us that it might be grossly inadequate in certain situations, just as it never occurs to astrologers to test wrong birth charts. Thus we see that the interpretation fits and conclude that astrology works. What could be simpler and more convincing? But, as we have seen, it is not nearly that simple, and our convincing conclusion can be dead wrong.

Astrologers take every advantage of their inferential deficiencies. To them everything is a correspondence and nothing is a coincidence—an idea that

The State of Astrology

Under this heading "The State of Astrology: Where Are We Headed?" 19 well-known U.S. astrologers recently gave views that tended to differ markedly from the usual bright optimism. According to them, astrology in the United States today is: at a dead halt, in a stormy situation of uncertain outcome, generally of decreased quality, in a very sorry state, plagued by bickering, too commercial, not accepted by society, maturing, often a waste of time, insufficiently person-centered, too person-centered, making progress, too ingrown, in trouble, in chaos, ignorant of relevant disciplines, and best in the world for its sensitive understanding of the human condition.

The main need is for: a theoretical basis, more facts and better theories, qualified people to do research, wider horizons such as application to ecological issues, reintegration of the sacred and the scientific, rigorous scientific testing, more person-centeredness, investigation of underlying mechanisms, proper accreditation, new ideas, more professionalism, better accreditation, more sophistication, thorough testing, and scientific research. (The views in each category total less than 19 because some astrologers evaded the question.)

Here the majority view is that astrology is in trouble and in need of proper testing. Perhaps the most heretical view came from John Townley, a respected, widely published astrologer with two decades of experience: "I would say that most of the accusers of astrology are probably correct. They think that astrologers are 100-percent charlatans, but I would bring it down to 90 percent. Not necessarily even intentional charlatans. But . . . they are suffering from the same failing. Maybe 50 percent of the people out there are deliberately selling hokum straight ahead." (Source: *Astro*Talk,* May/June 1986)

casinos disprove daily. Thus a Sagittarian cavalry officer will be seen as confirming astrology (the centaur, symbol of Sagittarius, is half-man, half-horse) even though the occurrence is at chance level and everything else in his chart says he should be a banker. This confident use of glaring inconsistencies has been surveyed by Culver and Ianna (1984) and aptly named the "Gemini syndrome," after the two-faced propensities said to be typical of Gemini.

However, although our judgments may let us down, this is no reason to go to the opposite extreme—not even the most rational person makes a statistical study of dentists before deciding where to get his teeth fixed. On this basis there is no reason to suppose that when people go to an astrologer they are any less rational than when they go to a dentist. The point is that, if we want to know what is *really* going on, then we must be aware of our inferential deficiencies and act accordingly—which of course is what the scientific approach is all about. An excellent survey of human inference is provided by Nisbett and Ross (1980) and is essential reading for anyone wishing to understand why astrology is seen to work despite the lack of factual evidence.

Perhaps the central problem in astrology is that astrologers, like most people, including the orthodox professionals cited earlier, are not aware of their inferential deficiencies and do not act accordingly. If they were, and did, then the present shouting match between astrologers and critics might never have arisen, always assuming that the critics could make the corresponding attempt to become informed about astrology. The same is of course true of most other paranormal areas.

Charts vs. No Charts

If correct birth charts really are as essential to astrological practice as astrologers claim, then astrologers using charts should consistently outperform astrologers not using charts, i.e., simply guessing. I recently put this to the test in a blind trial reported in detail elsewhere (Dean 1985).

From a sample of 1,198 subjects who had taken the Eysenck Personality Inventory, I selected the most extroverted, most introverted, most stable, and most unstable, 60 of each. Mean age was 30; 72 percent were female; and all knew their birth times. These extreme subjects were equivalent to the top and bottom fifteenths in the general population. Extroversion and emotional stability were chosen because they are perhaps the most major and enduring of known personality factors (Eysenck and Eysenck 1985) and are supposed to be readily discernible in a birth chart (Dean 1986).

The birth charts of these subjects were given to 45 astrologers (mostly in the U.S. and U.K.) ranging from beginners to internationally recognized experts. Each astrologer indicated which extreme he thought each subject was and how confident (high, medium, or low) they were in each judgment. Most of the astrologers agreed that the test was a fair one. On the average the judgments took each astrologer nearly 20 hours, or 4 to 5 minutes per judgment. Another 45 astrologers did the same task (circling their responses on the response sheets) but without charts; these judgments took 20 minutes.

If charts are essential to astrological practice, then astrologers using charts should have a distinct edge over those not using charts. But the results (Table 4) showed no difference; if anything, the judgments were made worse by looking at charts.

Further analysis revealed more bad news for astrology. Judgments made with high confidence were no better than those made with low confidence. Judgments on which the astrologers agreed were no better than those on which they disagreed. Supposedly crucial factors, such as experience, technique, use of intuition, and birth data accuracy, made no difference. Everything remained stubbornly at chance level.

The most damning result was the poor agreement between astrologers, the mean correlation being 0.10 for judgments and 0.03 for confidence. This indicates that 60 astrologers would on average be split 33:27 on judgments and 31:29 on confidence. (A value of 0.7 or more is generally considered satisfactory, 0.4 is poor, and 0.25 or less is useless; these correspond to a split

TABLE 4

Were the Judgments of Astrologers Using Charts Better Than Those of Astrologers Not Using Charts?

	Judgments by 45 astrologers using subjects' birth charts		Judgments by 45 astrologers without charts, i.e., guessing	
Subjects	Judged extrovert	Judged introvert	Guessed extrovert	Guessed introvert
60 extroverts	1,472	1,228	1,401	1,299
60 introverts	1,461	1,239	1,363	1,337
Percent hits	50.2		50.7	
	Judged unstable	Judged stable	Guessed unstable	Guessed stable
60 unstable	1,488	1,212	1,239	1,461
60 stable	1,462	1,238	1,170	1,530
Percent hits	50.7		51.3	

Answer: No. If anything the astrologers' judgments were made worse by looking at birth charts. *Source:* Dean (1985)

in judgments of roughly 5:1, 5:2, and 5:3, respectively.) The agreement was little better for astrologers using much the same technique and did not improve with experience—if anything, experts showed worse agreement than beginners. Other studies have found mean correlations that are just as poor. Vernon Clark (1961), in a famous blind trial involving some of the world's best astrologers (for example, Charles Carter and Marc Edmund Jones), obtained results that on inspection reveal 0.13 for 20 astrologers matching 10 pairs of charts to case histories, and 0.12 for 30 astrologers judging 10 pairs of charts for intelligence. Macharg (1975) found 0.17 for 10 astrologers judging 30 charts for alcoholism. Ross (1975) found only 0.23 for 2 astrologers rating 102 charts on five 5-point scales of the Psychological Screening Inventory, even though both had received a similar training, both taught astrology at the same college in Miami, and both followed Rudhyar's person-centered approach. Vidmar (1979) obtained results that on inspection reveal 0.10 for 28 astrologers matching 5 pairs of charts to case histories. Fourie et al. (1980) found 0.16 for two astrologers rating 48 charts on eighteen 9-point scales of the 16PF Inventory. Steffert (1983) obtained results that on inspection reveal 0.03 for 27 astrologers judging the charts of 20 married couples for marital happiness. In other words, in none of these studies was the agreement between astrologers better than useless. If astrologers cannot even agree on what a chart indicates, then what price astrology?

Does It Matter?

If astrology does not need to be true, and if astrologers cannot agree on what a chart indicates, does it matter? The answer depends on where you are coming from. If astrology is used as entertainment or a religion, then it cannot possibly matter. Nor would it seem to matter if astrology is used like Rorschach inkblots to provide insight: Just as there is nothing really there in inkblots, so we need have no concern if there is nothing really there in celestial inkblots—at any rate we can hardly outlaw the latter while the former goes free.

But if astrology is presented as being not merely helpful but also true (and most astrology books do so present it) then on present evidence the client is being exposed to semi-institutionalized dishonesty and all the dangers that this implies. Clients seeking ways to regain control of their lives are not helped by hints that this responsibility can be passed, however slightly, to the stars. Notwithstanding the dictum that the stars incline but do not compel (and which, judging from the conversation at any astrology conference, no astrologer actually subscribes to), the remedy is simple: Astrologers wishing to be taken seriously must become more responsible. They must become aware of relevant research findings, they must desist from making claims at variance with the known facts, and they must label their product honestly so that the public is not misled. Something like CSICOP's astrology disclaimer would be a step in the right direction. Until this happens, the professional astrologer will remain a contradiction in terms. Best (1983), editor of *Correlation,* the scholarly journal of research into astrology, has put the matter bluntly: "We really have no alternative. Either we put our house in order or someone from the establishment will sooner or later take great delight in doing it for us, or, alternatively, taking it apart brick by brick." I might add that the codes of ethics adopted by astrological organizations are useless in this respect, because in effect they are concerned with skating elegantly and not with thin ice. Which brings me to the final question: If astrology does not need to be true, what is the legal position?

Astrology and the Law

Western law has traditionally (and unfairly) regarded astrologers as mere fortune tellers. And fortune telling is usually illegal. But the situation is changing. Today in many countries, including the U.K., the United States, and Australia, an astrologer is as near as the yellow pages. In the United States the legal position of astrologers was recently summarized by the AFAN (1983) as follows: "As matters stand now, there are precedents for conviction of astrologers employing any and all of the usual ways of circumventing the fortune-telling laws: religion, grandfather clause, the Evangeline Adams case, the 'truth' of astrology, and just about any other defense you can think of has been tossed out of one court or another, largely due to the lack of committed,

adequate defense."

However, in 1984 there were two landmark decisions affecting astrology. The California Supreme Court of Appeals and a federal court both held that astrology and fortune telling are permitted free speech under the First Amendment of the U.S. Constitution (AFAN 1984, 1985). Among other things the First Amendment prohibits any law "abridging the freedom of speech." This was the first instance of a federal court ruling on astrology and fortune telling, the judge holding that "one need not have a scientific basis for a belief in order to have a constitutional right to utter speech based on that belief" (AFAN 1985). So even though astrology does not need to be true, the current U.S. legal view is that you have every right to practice it, just as you have every right to set up a Flat Earth society.

The Evangeline Adams case mentioned above was until recently the only instance in Western law where the details of astrological practice had been thoroughly examined in court. Because the case set a precedent and the verdict supported astrology, it is worth looking at.

The Strange Case of Evangeline Adams

The trial in 1914 of U.S. astrologer Evangeline Adams is famous among astrologers. The following account from the *Larousse Encyclopedia of Astrology* (Brau et al. 1980) is typical of those published in astrology books:

> Arrested in New York City in 1914 on a charge of fortune-telling, Adams insisted on standing trial. She came to court armed with reference books, expounded the principles of astrology, and illustrated its practice by reading a blind chart that turned out to be that of the judge's son. The judge was so impressed by her character and intelligence that he ruled in her favor, concluding that "the defendant raises astrology to the dignity of an exact science."

This gives the impression that the case was won because astrology was shown to be accurate and scientific. However, inspection of the court record tells a different story (New York Criminal Reports 1914). In the judge's opinion Adams did not pretend to tell fortunes. She merely indicated what the birth chart was supposed to mean and gave "no assurance that this or that eventually would take place." Therefore "she violated no law," and Adams was acquitted. There is only an indirect mention of the blind reading, and no mention of its subject or accuracy. Clearly the acquittal had nothing to do with astrology being accurate or scientific, and indeed the judge specifically states that the practice of astrology was "but incidental to the whole case."

Further inspection of the court record reveals a curious situation. I mentioned earlier the astrological dictum that individual factors must not be judged in isolation. Yet according to the following examples taken verbatim from the court record, this is exactly what Adams did:

Interpretation	Chart factor
Tendency to have great periods of depression.	Mercury in Capricorn
Strange fatality connected with mother's life.	Moon conjunct Neptune
Not likely to marry the first man to whom she was engaged . . . it indicated temptations.	Sun conjunct Uranus
Ambitious but lacking in confidence.	Saturn rising

Today no serious astrologer would dream of making such interpretations. For example, before finding a tendency to depression it would be necessary to examine at least the moon, Venus, Saturn, Neptune, cadent houses, triplicities, quadruplicities, and afflictions generally (Carter 1954). In other words, no astrologer could possibly claim that Adams's interpretations were accurate, let alone scientific.

So how could the judge conclude that Adams "raises astrology to the dignity of an exact science"? The answer is that he didn't, at least not in the sense implied by the quotation. The quotation is in fact incomplete and has been taken out of context, not from the final judgment, as we are led to believe, but from the introduction to the summing up. This introduction mentions that Adams had been a professional astrologer since 1897, that she had produced books in court, that her reading of a chart was "an absolutely mechanical, mathematical process," that "she claims that astrology never makes a mistake," that chart forms are used, and that "the defendant raises astrology to the dignity of an exact science—one of vibration, and she claims that all planets represent different forces of the universe." In other words, the judge is not saying that astrology is an exact science, only that Adams claims it to be so. So, in this legal case at least, contrary to what astrologers would have us believe, astrology did not need to be true.

Conclusion to Parts 1 and 2

In the past ten years, various studies have addressed astrology (the real thing, not popular nonsense) on the astrologer's terms. The results of these studies are in agreement, and their implications are clear: Astrology does not need to be true in order to work; and, contrary to the claims of astrologers, authentic birth charts are not essential. What matters is that astrology is believed to be true and that authentic birth charts are believed to be essential.

After surveying modern beliefs in astrology, Fullam (1984) comes to much the same conclusion:

> However, a system does not have to be real to be accepted as true as long as it is satisfying. Astrology has flourished because it is a framework within which people can discuss and look for meaning in their lives at the most superficial to the deepest levels of involvement in astrology.

Similarly, Kelly and Krutzen (1983) reached much the same conclusion

after a detailed analysis of Rudhyar's humanistic astrology, which according to many astrologers is the *real* real thing:

> The humanistic astrology of Dane Rudhyar is praiseworthy in its aims and shows an undoubted breadth of vision and concern for humanity. But it is dressed in obscurity and obfuscation. Worse, it . . . [requires] that no belief about anything could be false, thereby obliterating the distinction between knowledge and belief.

Thus the real thing emerges as a kind of psychological chewing gum, satisfying but ultimately without real substance. This does not deny the possibility that some as-yet-untested features of chart interpretation may work (e.g., indication of trends), or that some entirely new and valid astrological technique may be discovered, or that Michel Gauquelin's Mars effect may be eventually proved (the effect is still too weak to be considered as support for astrological practice), or that certain astrologers may achieve positive results in tests where others have failed, in which case the onus is on astrologers to demonstrate it. Nor does it deny the therapeutic utility of astrological beliefs—if invalid beliefs worked like a charm in phrenology they can do the same in astrology. What *is* denied is the essential truth of the real thing as practiced by most astrologers. As Dean and Mather (1985) note:

> Astrologers are like phrenologists: their systems cover the same ground, they apply them to the same kinds of people, they turn the same blind eye to the same lack of experimental evidence, and they are convinced for precisely the same reasons that everything works. But the phrenologists were wrong. So why shouldn't critics conclude for precisely the same reasons that astrologers are wrong?

Should astrologers wish to deny a state of affairs so contrary to their claims, all they have to do is perform appropriate tests. After all, why have a shouting match when you can have tests? However, it could be argued that the existence of mutually incompatible systems throughout astrology (for example, tropical and sidereal zodiacs), all of which are nevertheless seen as completely valid by their users, has already put this point to the test and given us convincing answers.

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Magic, Science, and Metascience: Some Notes on Perception

Magic is a deep reservoir of knowledge about perception. Scientists are ill-advised to dismiss it as simply entertainment.

Dorion Sagan

This article is based on a presentation, punctuated with sleight-of-hand demonstrations (described in italics), that the author gave at a physics colloquium at Syracuse University.

THE MAGICIAN James ("The Amazing") Randi is widely known for debunking the psychic claims of Uri Geller, carrying out his famous Project Alpha, and most recently exposing fraudulent faith-healers. Randi showed that Geller, though not a psychic, was once a birthday-party and night-club magician and that all his feats could be duplicated by known means. But a few mathematicians and physicists took Geller's effects as evidence of the paranormal. Harold Puthoff and Russell Targ of SRI International published a report in 1974 in the British scientific journal *Nature,* and reportedly still believe, that Geller's spoon-bending and other feats necessitate a reevaluation of the laws of physics.

Magicians draw upon a unique tradition that permits them to be at least as skeptical as scientists. Persi Diaconis, the Stanford University statistician who as a boy ran away with sleight-of-hand master Dai Vernon, said that if

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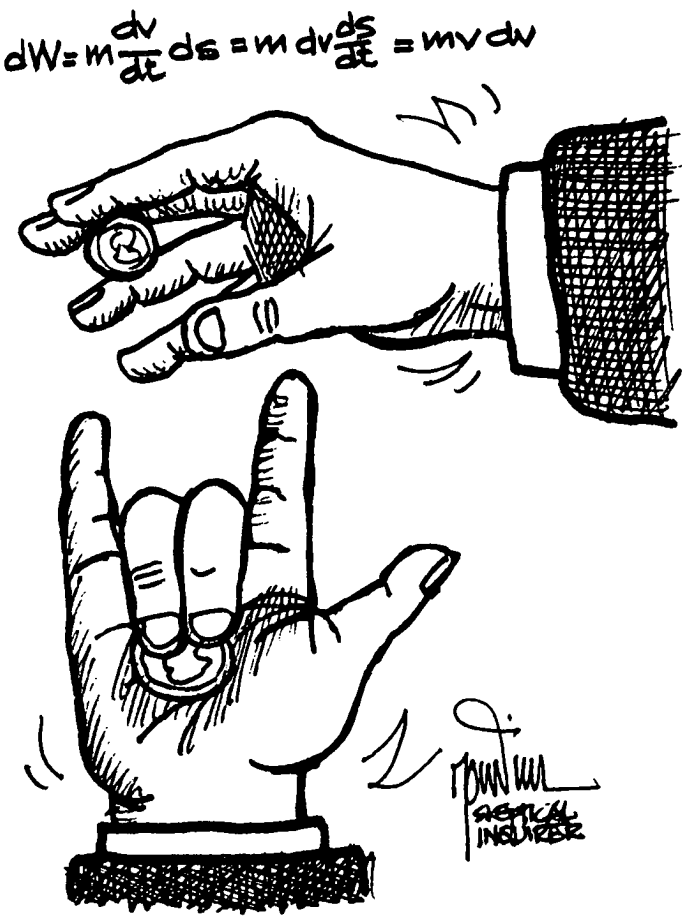

there were such a thing as a doctorate in magic he would have gone for that instead of statistics, for which he won a MacArthur Award. (Randi received a MacArthur Award last year.) Unfortunately, however, historically secretive techniques of magic have led to a divide between magic and science. Since about the time of Paracelsus, magic has not been taken seriously. If considered more than a form of entertainment, magic develops negative connotations. We can see this reflected in words like "fooling," "trickery," and "deception." But magic is based on a deep knowledge of perception. The magician influences his spectators to make perceptual deductions based on insufficient evidence. Magic effects contradict ordinary experience. From the magician's point of view it becomes clear that sensory input is not passive, direct, and inductive but deductive and participatory, based on the continual generation by the spectator of perceptual assumptions, of putting together the jagged pieces of visual experience into a single smooth whole.

(Two sponge balls are removed from an apparently empty purse frame.

One of these is torn into two. Upon blowing on them, both pieces expand into two full balls. The Roy Walton Bowl Trick is then performed, each ball consecutively disappearing from the magician's hand only to reappear under the bowl.)

Magicians recognize that scientists are among the easiest to fool. Though they are used to doubting at the level of hypothesis, scientists assume that their data are "raw" and objective. Due to the success of the scientific method, scientists become overconfident that they have a handle on the truth. Thus, paradoxically, they are even more vulnerable to the techniques of misdirection. While magicians will go to great lengths to misdirect, scientists assume nature to be passive, to "play fair."

The magical method of misdirection and the scientific method have certain differences. In science, results must be repeatable. In magic, tricks should never be repeated. Scientists openly state their theories and look for evidence to support or refute them. The magician, by contrast, never says what will be done in advance. The scientist usually confirms our view of reality. The magician usually upsets it. Nevertheless, magicians sometimes reveal their tricks and confirm our view of reality and scientists sometimes dramatically change our view of the world, which demonstrates that the division between magic and science is not ironclad. Both are really modes of perception.

Phenomena are explained differently depending on perspective. Consider someone who continually and correctly guesses five zener-card symbols (star, square, circle, plus sign, wavy lines) in a laboratory. Since they are called "ESP symbols," the subject may consider his correct guesses as evidence for precognition (if the cards were hidden from view) or clairvoyance (if one person looked at each card and asked another to receive his thoughts).

Since I don't have any special ESP cards, I'd like to do an experiment with a regular set of playing cards. Even though you may not trust me as much as when we began, I will try to simulate the controlled conditions of a parapsychological laboratory.

(Paul Curry's "Out of This World with Double-Blind Patter" is performed: The spectator shuffles and, without looking at them, says whether the cards should be put into a "black" or a "red" pile. The magician, having previously withdrawn a card from the pack in plain view, puts it down in the designated pile. After about 13 cards are placed down in this manner, two new piles are designated "red" and "black." The magician gives the deck to the spectator, who, without looking, deals the cards into whichever pile he selects. This second part of the experiment is considered "double blind," since neither the magician nor the spectator sees the cards. At the end of the pseudo-experiment, the colors of all the cards are shown to have been correctly divined. This is a so-called self-working trick: it does not require sleight of hand.)

I will not tell you how "Out of This World" is done because I want you to realize that if you can't figure something out immediately that doesn't mean you should postulate new or unproven principles. If people are really in-

terested in how such tricks are done, I strongly suggest they contact their local magician's supplies dealer and ask for a good book on mentalism.

If a Coke machine breaks near Uri Geller and he takes credit for it, some will consider it as proof of his power. The problem with this has been called the golf-ball-on-the-fairway fallacy. It is truly amazing that a golf ball lands on any one particular blade of grass. But that it lands on any is nothing special at all. For example, if you divide the height of the world's tallest building, the Sears Tower in Chicago, by the height of the Woolworth building in New York, you get 1.836, exactly one thousandth of the mass of a proton divided by the mass of an electron. Associations that to some seem meaningful, what Carl Jung called "synchronicity," are to others mere coincidences. But scientists, like spectators at a magic show, also "hunt" for and perceive patterns. Since all sciences depend on perception for data accumulation, and since magic is a deep reservoir of knowledge about perception, scientists are ill advised to dismiss magic simply as entertainment.

I have given a couple of examples of associations: Uri Geller and the Coke machine, ratios of tall buildings and small particles. To most educated people such associations seem arbitrary. In general, though, the value given to associations depends on how you have been directed, consciously or unconsciously, to see. From the standpoint of a magic show this could literally be your point of view. If you stand backstage, you see the mechanics of the show but not the effects. In the audience it is reversed: You can see the effects but not the mechanics. In physics, planetary motions can be described in a Newtonian or a relativistic way, but not both for all the available data at the same time. Is the Heisenberg Uncertainty Principle, that you can't measure both the position and the momentum of the same moving particle simultaneously, really a special case of a more general law of perception where the perceiver must make limiting choices? If a ball vanishes in my hand and appears under a bowl, is it a disappearance and production or an invisible transference that we perceive? Or do we perceive what is supposedly "really" happening, which is to say, the secret removal of the ball in question to one hiding place while a camouflage is stripped away to reveal a similar object in another place?

The shortest route between two mental points, like the shortest distance between two physical points on a Euclidian plane, is a straight line. This explains the compelling nature of symbolism, which connects things of a like nature, and also the psychological power of sympathetic magic. Sympathetic magic is where "like makes like," whether it be sticking pins in a doll to hurt a person or manipulating computer models to forecast the climate. Likewise, the dictum of Occam, popularly known as Occam's Razor, is an old standby of scientific reasoning that tells you to connect bits of evidence in the simplest fashion that will explain your observations. (See Elie Shneour's "Occam's Razor," *SI,* Summer 1986.) In science, Occam's Razor is useful because it helps connect the experimental results and observations of an enormous number of researchers into a cohesive whole. But this same mode of con-

necting perceptions—in the simplest fashion that makes sense—which is held up as a virtue in the interpersonal realm of science, is often considered a deficiency of individual thought. The easy or ad hoc association of an event with one preceding it or connected to it by some other blatant characteristic is called superstition. But, if this same easy association of events near to each other in time occur together a sufficient number of times, we take their connection to be invariable or even causal. As processes or things are correlated a fewer number of times, their relationship becomes one of "superstition." When birds are given food periodically, they move in circles, hop, or develop other quirks. They associate the food with their quirks. When their food comes their behavior is reinforced. Are these merely "superstitious" birds, or are they doing something akin to the generation of scientific hypotheses, albeit ones that in their minds have not yet been proven incorrect? I believe, and I am not the first, that it is very healthy to be skeptical not only in science but about science.

Science is individual perception writ large. Ludwig Fleck, in his book *The Genesis and Development of a Scientific Fact,* shows that for a long time syphilis was seen as a "carnal scourge," as evil spirits punishing those fallen from virtue. As medicine grew more rigorous, syphilis was differentiated from other genital skin diseases and began to be treated with mercury injections. It is almost humorous that mercury poisoning then became recognized as a distinctive symptom of syphilis.

Today syphilis is diagnosed by the Wasserman reaction, a test that detects cardiolipin correlated with the *Treponema* spirochetes said to cause syphilis. But is there any reason to believe that this time we have finally found the "true cause" and not just another correlation? I don't think so. The relation between spirochetes and syphilis seems more like that between worms and dead men: While the two almost inevitably correspond and while worms inhabiting half-eaten organs can be used as a reliable test for dead men, the idea that spirochetes cause syphilis, like the idea that worms cause dead men, can itself be labeled superstitious.

For me, both science and superstition partake of a magico-religious mode of thought for the simple reason that observations must be organized and the simplest working pattern proves the most expedient. That there is a gradation between superstitious and scientific thinking and not a sharp barrier is upsetting because it makes us realize knowledge is not absolute. (We only had to look at the rise of the importance of statistics to realize this.) Such a gradation explains why children are not deceived by magic tricks that baffle their elders: Having seen events or things connected fewer times than adults they are less likely to consider them causal. Young children see almost everything as magic because so few connections have been established. A grown-up, however, will make assumptions that a toddler would not even dream of. No list of scientific studies is needed to prove this, because without it magicians the world over could not ply their trade. If I close my left hand slowly over a coin held at the tips of my right finger and thumb and then my hands

naturally separate and you no longer see the coin at my right fingertips, you assume the coin is in my left hand. *(Retention-of-vision pass.)* So strong is this assumption, based on nothing other than repeated personal experience of moving things from hand to hand, that you actually see the coin in my left hand when it is not there. This impression is strongest when it has not been done before or explained. It shows us not that the hand is quicker than the eye, because it can be done very slowly. It shows us the opposite of the old phrase "Seeing is believing," that believing is seeing. What we believe—that the earth goes round the sun or the sun goes round the earth—crucially limits what we see and what we *can* see. Fleck calls this principle "directed perception," and the perceptual ecologist-magician David Abram, who visited with shamans in Sri Lanka and Nepal, calls it "participatory perception." If we see an object in one place and then suddenly it appears someplace else, we assume it traveled. This is part of the mode of human thought that corresponds to Occam's heuristic razor. Magicians viewing magicians have a different sort of directed perception. We may be looking for a secret hiding place or camouflage that takes away one object and some device that makes another appear. But in this case our form of perception will be equally directed and thus no less limiting. A magician or spectator on the lookout for method misses the magic; a spectator or magician ready for magic misses the method.

A question arises here, one that Abram is fond of stressing: Why do we call one form of perception magical and the other ordinary? Indeed, all perception is participatory—determined by what the spectator, researcher, or observer is looking for and ready to see. There are far too many details in daily life—not to mention those in the wider world detected by scientific instrumentation—to be organized without oversimplification and editing. Only details that fit in are included to form a cohesive view of the world. Others may be discarded, literally overlooked. Some valuable ones appear to science as magic tricks, and their inclusion may spur the development of a new world-view capable of explaining them. The advantage of science over superstition is that it organizes more bits of information and makes a conscious effort to doubt forms of directed perception, which it calls hypotheses or theories, that contradict or at least do not account gracefully for the collected facts. Unfortunately, this doubt at the level of theories and hypotheses is a source of scientific self-confidence that may turn into overconfidence at the level of fact-gathering, which is not always recognized for the highly selective process it is. I do not view its unusual doubting and openness to change as the primary strength of science but rather its station as a form of group perception. Science evolved beyond shamanism not because its associational tendency differs in kind from superstition but because language has amplified the available data to be correlated by the basic Occam's Razor style of human thought to massive numbers.

Perhaps the best way to view perception is as a statistical process where we sense only a portion of the world and must actively imagine the rest to

form a cohesive picture. Eyes do not rest but constantly dart around, lighting on different objects. Nonetheless a whole picture is formed of the world from this small sample. What the magician does is to offer a nonrepresentative sample to his audience. The spectator connects this preselected sample of data in normal ways only to realize it does not conform to normal reality and therefore must have been preselected. But the sample itself is not "wrong." It is just unlikely. Nobel laureate Sheldon Glashow's likening the world of theoretical particle physics to a cosmic magic show in which scientists try to figure out how things are done seems to strengthen the idea that perception is not passive but an active, participatory phenomenon.

In the *Doors of Perception,* Aldous Huxley compared perception to a "funnel" in which only a very selected portion of the nearly inexhaustible sensory stimuli are processed. Mind-altering drugs may work by breaking the funnel or by connecting "funneled" stimuli in new ways. The results are less entrained modes of perception with greater novelty than ordinary perception, but these are also more difficult to communicate because they are more diverse. Infants and children have not been trained to connect data in accepted ways and so are perceptually less directed yet have more potential to make fresh connections and see in new ways.

Understanding of perception on the personal level is important simply as a basic prerequisite to understanding science and technology as rational thought and conscious action at the societal level. In the history and evolution of science certain philosophers, such as Francis Bacon and Karl Popper, have come up with what we might call metascientific principles. For Bacon this meant calling attention to what he called simple induction by enumeration even though he often considered it insufficient "mera palpatio"—only that which can be told from a sort of feeling around in the dark. Karl Popper enunciated the principle of falsifiability whereby hypotheses were considered valuable insofar as they could be falsified, in other words proved wrong by new experimental evidence. Bacon used the phrase "interrogating nature" and contrasted it to merely accepting what seems to be the case. The problem is that where theories would be proved wrong because of new evidence the experimental results themselves are often dismissed or not even perceivable within the theoretical framework. Bacon and Popper nonetheless enunciated metascientific precepts that helped shape modern science. Since science leads to technology, it gives those who use it an advantage over those who don't.

I believe science is but one form of directed perception within the body politic, the most useful and methodic one but one that only shadows the full perceptual abilities of the individual. Maybe this is because, while the ancestors of individuals have been perceiving for millions of years, the group perception called science is much younger, having really evolved only with cities, writing, and the like. The potential of the group perception called science is greater but more immature than that of the average adult. Science perceives a far wider range than any individual. It is, for instance, very unlikely that any single person would see a meteorite land at his feet. Thomas

Jefferson, upon hearing that a stone had fallen from the sky in New England and that scientists from Brown and Harvard had gone to investigate eyewitness accounts, said: "I would rather believe that two Yankee professors lied than that stones fall from the heavens." While Jefferson was no dummy, science, able to pool a wide sample of individual perceptions, has shown that meteorites do land on Earth.

To take a similar example, recent evidence from the frontiers of astronomy suggest that galaxies are not uniformly spiral, circular, or combinations of the two. In far reaches of the sky, where we look back into time as well as space, great jets and fountains of stellar fluid are ejected into space. Sometimes galaxies meet and form new patterns, shooting jets of star spray over one another's shoulders. Looking back in time through telescopes, the early universe is seen to have been more highly energized but less regular in its star configurations. From the standpoint of directed perception, it seems our planet itself is only one particular point of view.

People seem to have reacted to the tremendous increase in record-keeping and knowledge by the use of Occam's Razor and similar methods of simplification. Our populations have expanded to such an extent that we have had to find ways of keeping our ever-more-crowded house in intellectual order if only to stay sane. These are not fundamentally new ways of seeing but evolutions of the old perception of the individual, sympathetic magic writ large. If society ever attains the level of perception that is the birthright of the individual, the smooth connection of events that we take for granted (to the unending glee of magicians), science will become a fascinating phenomenon indeed. •

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Velikovsky's Interpretation of the Evidence Offered by China in His *Worlds in Collision*

How did Velikovsky treat evidence from China to support his reconstruction of world history from 1450 to 687 B.C.?

Henrietta W. Lo

IN THE PREFACE of *Worlds in Collision*,[1] Immanuel Velikovsky claims that "formulated laws must conform with 'historical facts.' " On the other hand, he declares that only someone with psychoanalytical training, namely, he himself, can see through the "collective amnesia" of the human race to reconstruct the history of the worldwide cosmic upheavals of antiquity. He further asserts, in the Epilogue, that since these upheavals have invalidated the established chronology preceding -687,* the last phase of his celestial war, the histories of the ancient nations ought to be synchronized according to the catastrophic events experienced simultaneously by all peoples.

This article examines Velikovsky's use of the evidence offered by China to determine if he has adhered to his first claim. It will barely deal with his other claims, which are in fact unsound assumptions. For the definition of "historical facts" I use E. H. Carr's interpretation—facts that have been selected by a historian owing to their relevance to a past event and later accepted by other historians as significant.[2]

Since the beginning of their civilization, the Chinese have been keeping

*For the sake of brevity, the minus sign is used to denote the dates before the Common Era, or B.C.; and the plus sign, dates of the Common Era, or A.D.

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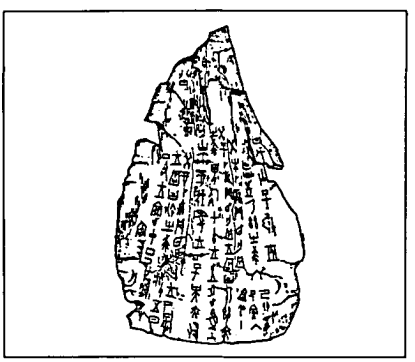
meticulous records of their past. Originally, the task was assumed by an official chronicler. Ancient China, like other primitive agrarian societies, was preoccupied with the observing, interpreting, and recording of astronomical phenomena in order to facilitate farming. A court-appointed clerk, who often functioned also as the official chronicler, was responsible for the task. Moreover, detailed astronomical records were usually included in the chronicles. At present, the oldest extant written documents are from the -17th century. Unfortunately, the written testimonies before the -11th century are mostly fragmented inscriptions on bronzes and oracle bones that are difficult to decipher. Nevertheless they provide definitive evidence that ancient Chinese civilization began at the latest with the Shang Dynasty, trad. -1623 to -1027.[3]



Oracle bone inscriptions, ca. -1600.

If Velikovsky's celestial wars did take place, in -1450, -1400, and between -747 and -687, evidence of them must exist in extant Chinese documents. The Chinese have recorded faithfully the many calamities caused by natural upheavals, e.g., "1,828 reports of flood and famine in the Huangho basin in the course of the last 2,000 years,"[4] and the numerous atrocities caused by human agents, i.e., wars and holocausts. If their records did not mention any celestial war it is because they had not experienced any rather than because, as Velikovsky postulates, they had erased the happening from their consciousness (to attain "collective amnesia") in order to survive the trauma caused by the disaster. Besides, Velikovsky states that, of all the catastrophes, the "flood" during the time of Emperor Yao is the only one that plays a conspicuous part in the recollection of the Chinese.[5] "The flood," owing to its dubious relevance to the Exodus episode, is the *prima donna* in the first act of Velikovsky's drama, which took place in -1450 and thereafter until -1400. Velikovsky believes that he has found the evidence to support his flood theme in the events occurring during the reign of Emperor Yao, trad. -2357 to -2256, which preceded his celestial war by 900 years. To investigate how Velikovsky arrived at such a conclusion, an examination of the evidence he used is in order here. Since Bob Forrest has done an excellent analysis of Velikovsky's use or abuse of sources, I will concentrate on the areas that were covered only minimally in that useful work.[6]

Besides translations of ancient Chinese texts, Velikovsky also relies on tertiary Western works, some of which are obviously worthless and hence categorically ignored by this article.[7] The Chinese texts used are the *Book of Historical Documents,* the *Memoirs of the Grand Historian,* and the *Annals of the Bamboo Books.*[8] Velikovsky states that the *Book of Historical Documents* was rewritten from memory or hidden manuscripts after the burning of books by Shi Huang-Di (the First Emperor, r. -246 to -211), who unified China under the Qin Dynasty.[9] If he had made an effort to verify this allegation he would have learned that the First Emperor's Edict of -213, which aimed at enforcing "thought control" to keep people ignorant, applied to the books owned by commoners only. The books that were in the state archives or in the collections of court scholars remained intact.[10] However, the controversy about the authenticity of the *Documents* arose because some editions, which surfaced decades after the Qin Dynasty was replaced by the Han (-206), were found to differ from the edition adopted by the Han rulers. The various pieces in the *Documents* were gathered mainly around the -8th century, and the collected work was later edited by Confucius (-552 to -479), according to Chinese tradition. The "Canon of Yao," chapter 1 of the *Documents,* has been accepted by Sinologists as authentic and as written in the -8th century. Despite Velikovsky's skillful selective editing, Bob Forrest has presented evidence in his *Velikovsky's Sources* to shatter Velikovsky's unfounded assertion that the "canon" provides proofs for the visitation of cosmic catastrophes on the Chinese.

As noted above, Yao preceded the first celestial war by nine centuries. Velikovsky's synchronizing efforts would not work, particularly in this case, because there is simply no standing room for Yao in the middle -1000s. The millennium-old Chinese practice of ancestor worship required that the Chinese carefully record their genealogies, especially those of the priest-kings. The *Memoirs,* compiled by Ssu-Ma Ch'ien (ca. -145 to -86), who, as the Han official historian, had access to the state archives, is widely recognized as a reliable source, even for the Shang period, trad. -1623 to -1027, as proven by the oracle bone and bronze inscriptions, excavated around the early +1900s. It contains a complete genealogy of the Shang monarchs.[11] Yao does not appear on the list.

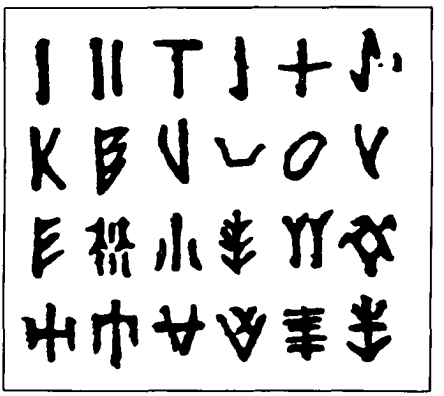
The *Annals,* dealing mainly with ancient Chinese chronology, was compiled for the ruler of the *Wei* state during the early -200s and found in his grave in +281. Unfortunately, it was lost during the Southern Sung Dynasty (+1126 to +1279), and forged texts appeared in Ming times (+1368 to +1643). From passages cited in some pre-Sung works, fragments of the authentic *Annals* were collated by modern scholars. In general it should be used with great care as a source of historical facts. The *Annals'* account of Yao's mythical birth—his mother was impregnated by a red dragon[12]—should have kept Velikovsky from including this source in his selective editing. Velikovsky, however, needed any written testimony that would supplement the one single document—the "Canon of Yao," which consists of only 440 characters—as

evidential support for his scenario.

According to orthodox scholarship, Yao was an immortal existing originally in Chinese mythology. As the oral traditions were handed down from generation to generation they were eventually recycled into history in the early years of the Zhou Dynasty (-1030 to -221) when euhemerization was in progress.[13] Yao personifies the forces at work that had brought civilization to the Chinese. Another legendary king, the Yu who saved China from the flood, according to Velikovsky's script, has come into existence through the same process. As pointed out by Bodde, the Yu flood is not a localized memory of any particular flood but part of the universal-flood theme symbolizing primeval chaos.[14] Similarly, Yu, who allegedly succeeded in draining off the flood waters and opening up waterways, personified the course of struggling against nature a society goes through to attain agrarian economy. The euhemerization process was superbly refined by Confucius and his disciples, who took it upon themselves to conserve and edit the ancient texts into classics. Hence Yao and Yu have been praised as the sage kings of ancient China whom all monarchs ought to emulate. The flood is not remembered by the Chinese because of its unusually catastrophic impact generating a "collective amnesia," as rationalized by Velikovsky. It is remembered rather as a symbol of Yu's selfless service for the people.[15]

Velikovsky, after reiterating his scenario of the cosmic catastrophe that Yao had to deal with, asserts that the period before the catastrophe is quite obliterated.[16] If he is talking about the period before -1450, he has ignored the fact that the record of China's history, confirmed by oracle bone and bronze inscriptions (which information was available before +1950 when *WIC* was published), goes back to the -17th century. If he is talking about the period before Yao, trad. -2357, he is likewise mistaken. Archaeological finds unearthed in the early +1950s at Ban-Po confirmed that the Chinese settlement there around -4000 was already protoliterate: certain basic numerals and crude word-signs were found on some excavated potsherds.[17] Unfortunately, the prehistoric Chinese, although they had produced beautiful pottery, did not use clay tablets as the Babylonians did for writing materials. Instead they used easily deteriorated materials like wood and bamboo strips. Nevertheless the mute evidence produced by prehistoric China (i.e., prior to -2200) that has been showing up in increasing quantity since the early +1900s does provide a record, though a very incomplete one, of China in antiquity.

Just as "the flood" is the focus of Act One of Velikovsky's cosmic drama, the abnormal movements of the sun, which caused the destruction of Sennacherib's army in -687, are the central theme of Act Two. Velikovsky needs to provide evidence to support his speculation that between -747 and -687 the battle between Mars and Earth caused various astral abnormalities throughout the world. The sources on Chinese astronomy mentioned by him were compiled by A. Gaubil, Abel-Rémusat, and Scaliger, all recognized as authorities of the field. But China's extensive astronomical records show that what Velikovsky considers as "rare" phenomena, such as eclipses, the falling



Crude word-signs on potsherds unearthed at Ban-Po, ca. -4000.

of meteorites, the lingering appearance of comets, the birth of novae, the effects of earth-shine and corona, and so on, have been observed and recorded regularly.[18] In fact, when Velikovsky quotes from the *Annals* that "a brilliant star appeared" to imply that the new-born comet Venus was causing the cataclysm of Yao's time,[19] he must have noticed that two lines below that sentence the *Annals* records, "the five planets looked like threaded pearls."[20] What China considered as the five planets had always been: Jupiter, Mars, Venus, Mercury, and Saturn. Hence Venus already existed as a planet in Yao's time, trad. -2400. William Mullen, a Velikovskian, says that Velikovsky has described himself as a psychiatrist by vocation and a historian by avocation.[21] How much credence should one give to Velikovsky's "historical facts" when he consistently changes the dates of historical events to support the conclusion of his psychoanalysis?

The "rare" phenomena Velikovsky seeks can be found easily in the catalogs compiled by the abovementioned European astronomers. One such occurrence, a meteor shower, did fall on March 23, -687, and the entry "Stars fell like rain" is based on, says Velikovsky, "old chinese sources ascribed to Confucius," but Velikovsky fails to name the *authoritative* sources.[22] Apparently Velikovsky cannot stretch such a terse statement, "Stars fell like rain," too far. Fortunately he finds, in the *Annals,* a similar occurrence during the reign of King Kwei of the Hsia Dynasty (trad. -2000s to -1623). Moreover, the same statement, "Stars fell like rain," was employed to describe that occurrence. Most important, this latter record contains other information he can manipulate to support his battling-planets hypothesis.[23] He therefore makes a most amazing leap and invents an interesting but imaginary logic. He proclaims that since the same statement was used by different sources to describe the occurrences, the latter record must have referred to one and the same event! As a matter of fact, "Stars fell like rain" (meaning "meteor showers") serves the same purpose as "It rains cats and dogs." Taking a brief glance at the chronology tables in *Memoirs,* one readily spots this statement here and there.[24] For example, it appears under -645, which is much closer to

-687 than -1678, the time of the event that was recorded in the *Annals.* It is impossible that Velikovsky is ignorant of the -1678 date; it is stated clearly in Legge's translation, which he has been using up to this point.[25]

Later, when Velikovsky again refers to the astral abnormality, after convincing himself that it happened on March 23, -687 instead of in -1687, he uses a different translation, which furnishes him with the necessary evidence for his alleged celestial war.[26] L. Wieger, whose selective editing is as remarkable as Velikovsky's, has translated the *Annals'* dull "chronicle of Kwei" into a sensational record of military endeavors. For example, the Chinese text says, "three suns appeared together," but Wieger's translation renders it into, "l'on vit deux soleils se battre dans le ciel."[27] How pleased Velikovsky must have been by his discovery of this translation! There is finally material for him to manufacture into supporting evidence for his alleged battle between Mars and Earth. The time element, a difference of a millennium, is still a problem despite his bold leap, because King Kwei, unlike Emperor Yao, is a historical personage rather than a legendary figure and was certainly not around anywhere in the whole universe on March 23, -687. Velikovsky tries to sweep this problem under the carpet by identifying King Kwei as the eighteenth monarch since Yao instead of indicating his reign dates: trad. -1688 to -1657. Even if Yao could have been fitted into Velikovsky's -1450 time-slot, King Kwei, being the eighteenth monarch following Yao, would need to reign, at the latest, 600 years after Yao (assuming 30 years to be the average span of each monarch's reign). This would place King Kwei in the -800s, still two centuries too early for the cosmic phenomena that supposedly caused Sennacherib's defeat.

Did China suffer any catastrophes caused by the type of cosmic upheavals described by Velikovsky between -747 and -687? No evidence supporting a positive answer can be found in the *Book of Poetry.*[28] This collection of folksongs, which were written between the -9th and the -5th century, has been recognized by Sinologists as an authentic and excellent source that illuminates the life of the Chinese from the late -11th to the middle of the -6th century. Neither can a positive answer be substantiated by the chronology tables in the *Memoirs,* which record major events systematically from -841 to -101.

Velikovsky assigns a special reason to calendar formulating or revision. He interprets such activities as evidence that the cosmic order has been disturbed by catastrophic astral upheavals. He therefore claims Yao's order to have the calendar adjusted as a strong proof. Chinese tradition has it that before Yao ascended the throne the country was in chaos and therefore the astronomer neglected his responsibilities to maintain an accurate calendar. Hence Yao took measures to remedy the situation as soon as he became the emperor. A simpler but more pragmatic explanation than Velikovsky's logic is that ancient peoples, while backward in mathematics and astronomy, need to go through various developmental stages to achieve accuracy in time-reckoning.

Velikovsky also insists that between -1400 and -700 all peoples in the world adhered to a calendar that had 360 days a year, which was divided into 12 months of 30 days each. Later, he further professes that the belligerent Mars had caused Earth to shift her poles, thus lengthening the year to 365.25 days. Oracle bone inscriptions have confirmed that the Chinese were aware, in the -13th century, that the sidereal year consisted of 365.25 solar days. Moreover they had established that there were 29 or 30 days a month and 10 days a week. In order to make their lunar year calculation correspond with the sidereal year so that the four seasons would be regulated, the ancient Chinese added an intercalary month in a three-year period or two intercalary months in a five-year span. The basic principle of this lunar year calendar remains more or less the same throughout the ages and is still in operation in China today.

To illustrate his speculation on "collective amnesia," Velikovsky chooses the dragon motif because it is prominent in many world cultures. He conjectures that the universal fascination with this theme originated in the viewing, by ancient peoples of the world, of the comet Typhon spreading "like an animal over the sky with its many heads and winged body, with fire flaming from its mouths."[29] He further theorizes that the dragon, a nonexistent object, symbolizes an extinct menace, which at one time terrorized the peoples of antiquity. The trauma was so great that the menace, in this case, the comet Typhon, left an everlasting impression of its image on the collective unconsciousness of mankind even though its *raison d'être* has been erased from human consciousness. The evidence he cites includes a Chinese dragon flag.[30]

One cannot help wondering whether Velikovksy, who must have come across the Chinese dragon motif often in his sources on Chinese civilization, really fails to realize that the Chinese dragon—*lung*—is very different from the dragon of Indo-European cultures. Although the Chinese dragon did not acquire the "royal" status officially until the -200s, it had existed in the Chinese consciousness before -1600. It appeared frequently on Shang and early Western Zhou bronze vessels, especially those used for religious rituals. It did not represent any capricious menace to the Chinese as Velikovsky imagines. Instead, it served as an agent to the Chinese—or their priest-kings, rather—in their task of communicating between heaven, "where all the wisdom of human affairs lies," and earth, the spirits, and the living.[31] Would the Chinese have given the dragon such a reverent treatment throughout their history if it had represented indeed an evil force in their collective unconsciousness? Suffice it to say, therefore, that the Chinese concept of dragon has disproved Velikovsky's hypothesis of "collective amnesia."

This investigation has discovered that Velikovksy has misinterpreted or even abused the evidence provided by China to support his reconstruction of world history from -1450 to -687. It has also found that *Worlds in Collision* is ridden by the problem of fact, the problem of logic, the problem of scholarship, and the problem of culture. In 1974, Velikovsky declared: "Nobody can change a single sentence in my books."[32] Did he really mean to

The Chinese dragon has only one head and rarely does it appear with fire flaming from its mouth. It is the topmost divinely constituted beast and signifies every auspicious thing under the sky. Bronze *kuang* (libation bucket) with dragon design, ca. -1600. (From *Historical Relics Unearthed in New China*, Foreign Languages Press, 1972.)

Bronze *yu* (libation bucket) with dragon motif, ca. -1600. (From *Historical Relics Unearthed in New China*.)

have the statement taken literally? If the answer is positive, how could he expect the science community to treat his writings as other than fiction? Similarly, the history profession is justified in its overall silence to his efforts in "reverse history," which culminate in books like *Worlds in Collision.*

Notes

1. Immanuel Velikovsky, *Worlds in Collision* (New York: Pocket Books, 1977). Henceforth cited as *WIC*.

2. Edward Hallett Carr, *What Is History?* (New York: Knopf, 1962), pp. 8-11.

3. The history of the Shang Dynasty is still awaiting rewriting, owing to new evidence unearthed by archaeological excavations that have been going on in China since the early +1900s. One particularly notable find was yielded by the +1928 to +1937 excavation at An-yang, the last Shang capital, established around -1301. However, based on the earliest extant Chinese texts, it has been confirmed that the dynasty had thirty kings whose collective reign lasted for about 600 years. Nevertheless, inconsistencies exist among the ancient texts regarding the dating of the dynasty, which has been a heated debate among modern-day experts on ancient China. The most influential dates are -1766 to -1122, -1711 to -1111, and -1623 to -1027. The last dating is most popular among contemporary Shang scholars. See Kwang-chih Chang, *Shang Civilization* (New Haven: Yale University Press, 1980), pp. 16-19.

4. Kwang-chih Chang, *Early Chinese Civilization* (Cambridge, Mass.: Harvard University Press, 1976), p. 66.

5. *WIC*, p. 115.

6. Bob Forrest, *Velikovsky's Sources* (Manchester: Forrest, 1983). Sections 12, 55, 56, and 57 deal with Chinese sources specifically.

7. For example, J. Hübner, *Kurze Fragen aus der politischen Historie* (1729); Hans Bellamy, *Moons, Myths and Man* (1936).

8. Henceforth referred to as the *Documents*, the *Memoirs*, and the *Annals*, respectively. Velikovsky used basically James Legge's monumental translations of the *Documents* and the *Annals* on which this study also relies. This paper, however, uses a modern yet authoritative Chinese edition of the *Memoirs:* Ch'ien Ssu-ma, *Shi-ji* (Hong Kong: Zhong-hua, 1969).

9. *WIC*, p. 116.

10. Ch'ien Ssu-ma, "History of the First Emperor," in the *Memoirs*. Even though the Qin state archive was burnt when a rebel leader fired the palace about -206, copies of ancient texts in official and even private collections did survive.

11. The complete list of the thirty Shang monarchs is reprinted in Kwang-chih Chang, *Shang Civilization*, op. cit., p. 6.

12. James Legge, *Annals of the Bamboo Books*, vol. 3, Pt. 1 of his *Chinese Classics* (Hong Kong: Hong Kong University Press, 1960), p. 112.

13. Derk Bodde, "Myths of Ancient China," in his *Essays on Chinese Civilization* (Princeton, N.J.: Princeton University Press, 1981), pp. 45-84. Euhemerization is the process of interpreting myths as accounts of actual historical events and people.

14. Ibid., p. 78.

15. According to Chinese traditions, for nine years Yu was so devoted to solving the flood problem that he did not even see his family. Thrice he passed his house but did not stop to enter, although he heard his infant son wailing from within.

16. *WIC*, p. 117.

17. Ping-ti Ho, *Cradle of the East* (Chicago: University of Chicago Press, 1975), pp. 223-226.

18. Joseph Needham, *Mathematics and the Sciences of the Heavens and the Earth*, vol. 3 of *Science and Civilization in China* (Cambridge: The University Press, 1959), pp. 409-436.

19. *WIC*, pp. 116, 169.

20. Legge, *Annals*, p. 112.

21. *Velikovsky Reconsidered* (New York: Doubleday, 1976), p. 246.

22. *WIC*, p. 241.

23. Legge, *Annals*, p. 125. On page 241 of *WIC*, Velikovsky cites the entry, "In his 10th year the five planets went out of their courses. In the night stars fell like rain." However, he then chooses to ignore not only the time when the event occurred, -1678, but also the fact that there were already five planets, including Venus.

24. Needham, op. cit., p. 433. Needham claims that Chinese recordings show that the average period of recurrence of meteor showers was 33.25 years.

25. Legge had accepted -1523 as the beginning date of the Shang Dynasty. Since this paper has chosen a date that precedes Legge's by a century, all other dates used by Legge for ancient China, namely, -2200 to -246, will be moved back likewise. Consequently, -1578, the date specified in Legge's *Annals*, is replaced by -1678.

26. *WIC,* p. 260.
27. L. Wieger, *Texts Historiques* (1922–1923), vol. 1, p. 50, cited in Bob Forrest, op. cit., p. 421.
28. Legge, *Book of Poetry,* vol. 4 of *Chinese Classics,* op. cit.
29. *WIC,* p. 310.
30. *Ibid.* Since 1912 when despotism was replaced by republicanism as the government structure of China the dragon has never appeared on a Chinese flag.
31. Kwang-chih Chang, *Art, Myth and Ritual* (Cambridge, Mass.: Harvard University Press, 1983, pp. 45, 65-68, 78. Excellent illustrations of the dragon motif on bronze vessels can be found on pp. 58, 77, 92.
32. Immanuel Velikovsky, "My Challenge to Conventional Views in Science," *Humanist,* 37 (November–December 1977), 10. •

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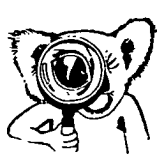

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Book Reviews

A Too Willing Suspension of Disbelief

The Enigma of Loch Ness: Making Sense of a Mystery. By Henry H. Bauer. University of Illinois Press, Urbana and Chicago, 1986. 243 pp. $22.95.

Edward Kelly

ON THEIR tour of the Hebrides in the late eighteenth century, Samuel Johnson and James Boswell made passing remarks on Loch Ness. Dr. Johnson thought it remarkable that Boethius had said the lake was twelve miles wide, when in fact it was only about one mile wide; and he concluded that, when accounts exceed the truth, one reason is that men exaggerate to themselves as well as to others. Boswell, on the other hand, was charmed by the legends that even then surrounded Loch Ness, and he repeated a story told him by one of the locals: A lake monster had come ashore and devoured a little girl. This "wild beast or sea-horse" was then quickly trapped by the girl's father and destroyed on a "red-hot spit." Boswell noted that the man did not smile when he told him this story. In the *Enigma of Loch Ness,* Henry H. Bauer, too, unsmilingly explains why he believes that monsters do exist in Loch Ness, and he undertakes to explain such beliefs as rational.

Edward Kelly is a professor of English at the State University of New York College, Oneonta, N.Y. He has followed the Loch Ness controversy for many years.

A professor of chemistry and science studies and past dean of the College of Arts and Sciences at Virginia Polytechnic Institute and State University, Dr. Bauer does not cite in his pages of "prehistory" the observations of Johnson and Boswell. (He particularly does not like descriptions of the monster that allege it goes on land as well as in water.) He begins with the "eyewitness" account of Saint Columba, who in 565 commanded a water monster in Ness not to attack a swimmer. Bauer opines that this initial incident, along with other legends and Celtic myths, should not help persuade a doubter that "a claimed natural phenomenon does not exist, simply because it is referred to in folklore"; in fact, such early accounts have "appreciable evidential value for believers," he says.

Throughout the book, Professor Bauer states and restates his purpose in writing *Enigma,* which is to detail the controversy over Loch Ness monsters and make sense of the mystery. His thesis does not attempt to persuade the reader one way or another; instead, he aims to move in the direction of the "*whole* truth." Just as he felt scientists, especially astronomers, treated Velikovsky unfairly, so too Bauer believes scientists, especially biologists, have neglected to investigate the incidents at Loch Ness over the years. Although Bauer writes that "science is not synonymous with truth," he would be pleased if scientists would join amateur monster-hunters in their efforts at Loch Ness.

In his concern with investigating the psychological, sociological, and philosophical motives of searchers in the Loch, Bauer can become intensely self-analytical:

> My own belief in Nessies is grounded on film and photos and the pattern of confirmatory sonar and eye-witness testimony and so forth, but I have never (so far as I know) seen one. No doubt a personal sighting would remove all shadow of doubt for me, but it ought not to (unless it were at closer quarters and with more of Nessie showing than in any sighting of which I have heard).

Also, at the end of this book, in a chapter entitled "Nessie, Science, and Truth," he says, "I shall conclude then by trying to justify as rational, albeit, not scientific, my personal belief that Nessies exist." In other words, even if Bauer is wrong, he does not want to be thought crazy or irrational in the process of his thinking. A reader gets the uneasy feeling that some kind of irony or humor must be playing here and in other parts of *Enigma,* but without any evidence that it is conscious on the part of Bauer.

Bauer sees nothing but dead seriousness in his own position. With straight face he recalls seeing a UFO with flashing lights late one afternoon in 1970 in the skies over Lexington, Kentucky. He chased the object by car but got no further information on it. Later that night it returned, and he realized that it was a Goodyear blimp. And 30 years ago Bauer saw a sea serpent in the Indian Ocean: "a succession of black humps, many miles from the ship." However, when he examined the object through 20X binoculars, he discovered the "creature" to be the wake of another ship invisible to the naked eye. No doubt he intends such candor to illustrate his open-mindedness and willingness to correct initial interpretations. However, a reader may allow him a mind generally predisposed toward fringe belief.

Early in the text Bauer says: "I respect the achievement of biological science and those who practice it; I respect the monster hunters and their endeavors," although "one must distinguish the honest and reliable monster hunters from the fraudulent or gullible ones." Of course the same goes for legitimate scientists. Yet, because of his being persuaded over the years to believe in Nessies, Professor Bauer must rely on

the "community of monster buffs" to help support his contention that a plausible case has been made for the existence of LNMs. The dedication page of *Enigma* calls forth a litany of evidently "honest and reliable" monster hunters:

To the pioneers at Loch Ness

Rupert Gould
Constance Whyte
Tim Dinsdale
David James
Robert Rines

and the champions of the sea serpent

A. C. Oudemans
Rupert Gould
Bernard Heuvelmans

(Why overlook good old Roy Mackal? Pity.) Names of the dedicatees and their works appear again and again throughout *Enigma* in support of the case Bauer makes for the existence of Nessies. The conventional arguments offered by Gould, Whyte, and Dinsdale underpin the pro side of the controversy.

Dr. Bauer also presents the doubter's position, sorting evidence for significant relevance, sifting through the "wheat and chaff" of questionable photos, and listing bad and illogical reasons for believing in LNMs. He does attempt to be fair despite this bias. But poor, sloppy scholarship on Loch Ness, as well as blatant hoaxers, incur his wrath. For example, Bauer finds Peter Costello's writing on lake monsters particularly inaccurate. Costello is guilty of wrong dates, misspelling "Heuvelmans," and construing Rines as "Rhine" and "Rine." (However, Bauer, himself is far from spotless in this category, regularly omitting the ae ligature in *Encyclopaedia Britannica,* for example, and inconsistently listing references in his lengthy bibliography and cursory index.) He finds monster-hunter Frank Searle particularly reprehensible. Knowledgeable Nessie hunters believe the great majority of Searle's photos fraudulent; and Searle, who was once thought to be a reliable Ness watcher, has fallen into disrepute. Yet, while Bauer wonders how much harm may have been done the quest by the likes of Frank Searle, he praises Robert Rines and the "Academy of Applied Science." He gushes over the teams organized by Rines, which offer a "dazzling combination of the highest expertise" in photography, sonar, and "electronic gadgetry in general." He thinks Rines's work will in time become "a model of how one attacks a novel problem." However, some criticism of Rines may be culled from the notes and bibliography. After all, the book is Bauer's, and he thinks some opinions better than others.

For all its paraphernalia, *Enigma* is truly a short read-through. The running text accounts for only about a half of the total work. This caveat does not suggest that Bauer overlooks any noteworthy details of the complete Loch Ness story. There just is not much to tell, a fact that probably accounts for the book's occasional repetition and digression. The remainder Bauer devotes to appendixes and bibliography. One appendix lists about 800 reported sightings of Nessie. (Surprisingly, throughout this list Bauer includes the work of both Costello and Searle!) In any case the usefulness of such a device is questionable. Next comes the monumental bibliography, which goes on for thirty pages, citing books, sections of books, magazine and journal articles, and numerous newspaper references from selected papers on the LNM. One

wonders how a list of dozens of articles appearing in *Fate,* for example, might be of use to the scientists Bauer would encourage to take an interest in investigating Nessie. Perhaps the bibliography best shows the popularity of the subject in a variety of print media in recent years.

Despite the point of view from which *The Enigma of Loch Ness* is written, the book does bring together two sides of a "controversy" clearly evident to Bauer; and in his outlining the position of true scientists versus the pseudoscience of many monster hunters, he does try to be fair. Anyone interested in the goings on at Loch Ness should surely read Bauer's book—but without expecting to find much new. •

Wishful Seeing

The Face on Mars: Evidence for a Lost Civilization? Edited by Randolfo Rafael Pozos. Chicago Review Press, 814 North Franklin, Chicago, IL 60610, 155 pp. Paper $12.95.

Jon Muller

THIS BOOK is an edited version of the proceedings of a teleconference interpreting a "face" and other Martian features photographed by Viking Orbiter 1 in 1976. Dismissed by NASA as a "trick of lighting," the facelike feature is about 1.6 km wide and superficially resembles a squared human face lighted from the upper side. (See Martin Gardner's column on the Great Stone Face in the Fall 1985 issue.) Two of the participants had rediscovered the "face" in 1979 and had used an anti-aliasing technique for processing its images. In 1983, the teleconference began with about 15 participants, although some are barely represented in the edited text of the conference. Many of the participants were either directly or indirectly associated with SRI International, well known to readers of the SKEPTICAL INQUIRER for its involvement in psychic and other borderline topics. The author/editor, Randolfo Pozos, is a Ph.D. in medical anthropology, and one of the main contributors, Richard Hoagland, is a self-educated science advisor and writer. Examination of the edited conference texts shows that many of the participants are favorably inclined toward creationism, the Turin shroud, and other borderline doctrines.

The Face on Mars is a peculiar book. The participants were clearly making a sincere effort to apply scientific principles, and the book actually includes criticisms challenging the basic assumption that the face is anything more than an illusion. Unfortunately, it is clear that the majority of the participants were not sufficiently cautious or scientific in their approach. The book's internal review by Gene Cordell sums this up nicely: "Ultimately, there is little difference between the teleological thinking evidenced in this conference and the teleological thinking promulgated by the 'creation scientists.' The 'creation scientists' start from the premise that the Bible is absolutely true and then set about to support the Biblical story while casting doubt

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on the accepted scientific theories. This conference started with the premise that the 'face' was the creation of an alien intelligence, and was thereafter directed toward this very conclusion" (p. 97).

Careful reading shows that the conference starts with some caution in interpretation, but the terminology used soon becomes self-fulfilling. Can anyone doubt that a feature referred to as a "city" is the result of intelligent agency? Given the surprisingly few references to Martian canals in this book, it is useful to recall Sagan's comment in *Cosmos* on those features: "Lowell always said the regularity of the canals was an unmistakable sign that they were of intelligent origin. This is certainly true. The only unresolved question was which side of the telescope the intelligence was on."

We see what we wish to see. A key image in the discussion of the feature is NASA frame 753A33. This image shows the so-called face lighted from the opposite direction. Almost all the participants in the teleconference suggest that this frame shows the "symmetry" of the face. In fact, the orientation of the "face" feature in 753A33 does not suggest symmetry on the "nose" line of the feature, but on a diagonal across the face, so that it is a ridge feature similar to many others in the frame. This interpretation is strengthened by the fact that a considerable amount of confusion existed among the participants about which feature was the face in this lighting. (See p. 94 and elsewhere.) Measurement of angles in the area shown in NASA 753A33 shows that the angle of the feature ("face") is well within the range of orientations of the other natural features in the frame. Once the supposed face is accepted by the participants as artificial, then a whole range of other natural features and some imaging artifacts are elevated into a "city," a "fortress," many "pyramids," and other indications of Martian intelligence. Given their own dating (primarily from indications of a supposed solar alignment), it is hard to see why a modern human face would be portrayed on Mars, since the youngest date is much earlier than the emergence of the present form of our species.

The argument is all too often circular, and supposed tests of issues are often the same data as those used to identify the feature in the first place. Particularly interesting cases of self-convincing may be found in the "honeycomb grid" and in the astronomical alignment of the "face" and the "city." Hoagland asks how the honeycomb could be an imaging artifact and "*know* where to place itself in the 1 mile square most meaningful to an artifactual interpretation of its presence" (p. 34). In the case of the alignment to sunrise, something like the following procedure was employed: (1) A right-angle line was drawn out from the "profile" view of the "face" (which is probably not oriented in this way) and an "organized" area called the "city" was hypothesized on this line. (2) Once the alignment is taken as given, the angle to a summer solstice would correspond to this alignment if the planet were tilted 17.3°! Since something like this tilt would (perhaps) be enough to alter the climate on Mars to more Earth-like conditions, the case can be taken as proved, Q.E.D. [*sic*]! Given the power to choose any of a number of solar, much less other celestial alignments, and the ability to choose any age and to move the planet to fit the hypothesis, it is not surprising that some kind of more or less internally consistent model can be built. This does not, unfortunately, constitute a test in any meaningful sense.

Some of the commentary is "California Cosmic" enough that one would almost suppose that Pozos is doing this tongue-in-cheek. Pozos is trained as a medical anthropologist; but, if his comments here are not parody, he certainly is not well informed on either archaeology or the philosophy of science. His initial response when he was asked to participate was: "I am not an archaeologist, it's not my field" (p. 2). He should have stuck to his refusal. •

Some Recent Books

Listing here does not preclude review in a future issue:

Blackmore, Susan. *The Adventures of a Parapsychologist.* Prometheus Books, 700 East Amherst St., Buffalo, NY 14215, 1986. 249 pp. $19.95. A lively first-person report on the author's research in ESP, occultism, poltergeists, Tarot cards, and out-of-body experiences. Beginning a believer, she ended a skeptic. Her insights into the special problems of parapsychology will be of interest and value to all persons involved in the debates over the methods and claims of parapsychology.

Blinderman, Charles. *The Piltdown Inquest.* Prometheus Books, Buffalo, N.Y., 1986. 261 pp. $22.95. Clark University professor culled archival materials only recently made public and other historical records to chronicle this complete-as-possible story of the Piltdown hoax, still one of the strangest episodes in the history of science. Presents his own lineup of suspects and his own proposed solution to the hoax.

Crews, Frederick. *Skeptical Engagements.* Oxford University Press, New York, 1986. 244 pp. $19.95. Collection of essays and articles by Berkeley professor critically analyzing Freudian claims. He argues that psychoanalysis is a classic pseudoscience, a doctrine insisting on its rigorous evidential basis while refusing to be bound by the ethics of disconfirmation.

Harris, Melvin. *Investigating the Unexplained.* Prometheus Books, Buffalo, N.Y., 1986. 222 pp. $19.95. A BBC broadcaster and professional researcher's report on his investigations into a wide variety of extraordinary tales: the Amityville Horror hoax, hypnotic regressions to past-lives recorded on the Bloxham tapes, psychic detectives involved in the search for Jack the Ripper, and a wide variety of other mysteries, alleged and real. In each case he began not knowing whether the tale as told was true or not. More often then not he had to report to the television producers that delusion or deception was involved.

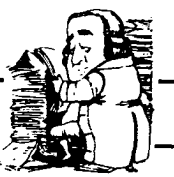
Kurtz, Paul. *The Transcendental Temptation.* Prometheus Books, Buffalo, N.Y., 1986. 500 pp. $19.95. A comprehensive critique of religion and the paranormal based on a lifetime of philosophical scrutiny. An exploration into, among other things, the striking similarities between paranormal belief systems of today and the classical religions of the past. Examines not just the claims of religions but the pretensions of fraudsters like the Fox sisters, D. D. Home, Palladino, and Geller, and the unproductive researches of Rhine and Soal. Finds that there are similar psychological and sociological processes involved in the acceptance of all who pose as prophets or present claims of special powers. This is the propensity for magical thinking, "the transcendental temptation."

Moore, K. D. *A Field Guide to Inductive Arguments,* Kendall/Hunt Publishing Co., P.O. Box 539, Dubuque, IA 52004, 1986. 161 pp., paper. A wonderfully instructive manual for identifying and evaluating inductive arguments encountered in everyday life. Filled with short case-study examples of applying critical analysis to such things as risks and hazards, astrology, vitamin C, handwriting analysis, water witching, psychic surgery, UFO sightings, and so on.

Wilcox, Laird. *Guide to the American Occult: Directory and Bibliography.* Editorial Research Service, Box 1832, Kansas City, MO 64141, 1986. 61 pp. Directory of organizations and periodicals involved in some way in things occult, paranormal, mystical, or parapsychological.

—*Kendrick Frazier*

Articles of Note



Anderson, Ian. "Tasaday: Stone Age Survivors or a Modern Hoax?" *New Scientist,* October 23, 1986. Report on claims that the story of a small band of tribal cave-dwelling people reportedly discovered in the Philippines in 1971 was a hoax. Scientists from the Philippines, the U.S., and Australia are lined up on both sides of the issue.

Dawkins, Richard. "Creation and Natural Selection." *New Scientist,* September 25, 1986, p. 34. Shows that the complaints by critics of Darwinian selection who argue that biological adaptations are impossible are based on a misunderstanding of the nature of selection. Emphasizes the distinction between single-step selection (which indeed would be extremely slow) and cumulative selection (in which each adaptation, however slight, is used as a basis for future building). Illustrates all this with a computer program.

Durm, Mark W., Crispin L. Terry, and Cathy R. Hammonds. "Lunar Phase and Acting-Out Behavior." *Psychological Reports,* 59:987-990, 1986. Psychologists at Athens State College used psychiatric records of an Alabama hospital over a three-year period to ascertain whether potentially dangerous erratic behavior among mental patients increases during the full-moon phase. This study, like many previous similar studies, showed no significant increases during the full-moon phase.

Eve, Raymond A., and Francis B. Harrold. "Creationism, Cult Archaeology, and Other Pseudoscientific Beliefs." *Youth & Society,* 17(4):396-421, June 1986. Report on the prevalence and distribution of certain pseudoscientific beliefs among 400 students at a large university. (See *SI,* Fall 1986.)

Farlow, James O. "In the Footsteps of the Dinosaurs." *Nature* (correspondence), 323:390, October 2, 1986. Scientist reinforces other reports that most of the structures in Texas identified as "man tracks" are not footprints at all but simple solution features or scour marks; those that are tracks are footprints of bipedal

dinosaurs altered by weathering and other natural processes.

Gould, Stephen Jay. "Darwinism Defined: The Difference Between Fact and Theory." *Discover,* January 1987, pp. 64-70. Excellent essay on the confusion between the fact of evolution ("as well established as anything in science") and still-debated theories or statements about the *causes* of documented evolutionary change. Addresses the problem of people committed to reason and honorable argument who nevertheless misunderstand or ignore this distinction, among them political commentator Irving Kristol and writer Tom Bethell. Also argues that religion and science operate in separate domains but have a common goal: "the shared struggle for wisdom in all its guises."

Gratzer, Walter. "A Litany of Folly." *Nature,* 322:781, August 28, 1986. Review of Irving M. Klotz's *Diamond Dealers and Feather Merchants: Tales from the Sciences* recounts many instances of credulity and "thunderous gaffes" by scientists.

Hill, Oliver W., "Further Implications of Anomalous Observations for Scientific Psychology"; William F. Vitulli, "Secondary Sources in Parapsychological Research: A Vicious Cycle"; Edward J. Clemmer, "Not So Anomalous Observations Question ESP in Dreams"; Irwin Child, "Reply to Clemmer." *American Psychologist,* October 1986, pp. 1,170-1,174. Series of exchanges about parapsychology research.

Hövelmann, Gerd H., and Stanley Krippner. "Charting the Future of Parapsychology." *Parapsychology Review,* 17 (6):1-5, November-December 1986. Criticism from within the field of parapsychology. The authors offer 11 recommendations for improving parapsychology research. Examples (here briefly paraphrased): stop making revolutionary claims, rely less on spontaneous cases or quasi-experiments, exercise extreme restraint on claims of survival after death, keep clear of untestable notions permeated with supernaturalism and metaphysics, listen to all outside skeptics, and consider explanations other than the psi hypothesis. A commendable and thoughtful critique.

Hughes, Kathleen A. "Thinking of Buying or Selling a House? Ask Your Astrologer." *Wall Street Journal,* November 10, 1986, p. 1. Not an investigative or debunking article, but nevertheless contains useful information on the apparently increasing use among home buyers of astrological advice and other superstitions in making their decisions.

Jewett, D. L., et al. "The Lack of Effects on Human Muscle Strength of Light Spectrum and Low-Frequency Electromagnetic Radiation in Electric Lighting." *Journal of the Illuminating Engineering Society,* November 15, no. 2, Summer 1986, pp. 19-29. Evaluation of the contention that muscle strength is affected by lighting variables fails to support it. Finds that John Ott's "kinesiology testing" is not a valid measure because the result is highly influenced by the beliefs (and possibly the suggestions) of the tester.

Joyce, Christopher. "Genesis Goes on Trial." *New Scientist,* December 11, 1986, pp. 46-49. Good report on the background behind the creationism case taken to the U.S. Supreme Court.

Kemp, Tom. "Feathered Flights of Fancy." *Nature,* 324:185, November 13, 1986. Devastatingly critical review of the Hoyle and Wickramasinghe book alleging that the archaeopteryx fossil is a forgery. These two eminent British astronomers "exhibit a staggering ignorance about the nature of fossils and the fossilization process," says Kemp, curator of the University Museum, Oxford. The features they question "all reflect quite common, perfectly explicable aspects of the process

of formation of a fossil." Kemp wonders why this "otherwise worthless book" was written and worries about its effect: "I am afraid that it . . . will undoubtedly gain currency amongst Creationists. . . . At best this book is mischievous; at worst it might well be described as evil because it betrays that morality of objectivity that science cherishes." Investigations like this should be done by those who actually understand fossil processes, "not by a couple of people who exhibit nothing more than a Gargantuan conceit that they are clever enough to solve other people's problems for them, when they do not even begin to recognize the nature and complexity of those problems." (See also Whybrow, below, and earlier articles listed in our Winter "Articles of Note.")

Kronholz, June. "Saga of 'Lost' Tribe in Philippines Shows Marcos Era's Dark Side." *Wall Street Journal,* September 16, 1986, p. 1. The emphasis here is on the political aspects of the Marcos administration's sponsorship of the Tasaday as Stone Age people.

Lindsey, Robert. "Spiritual Concepts Drawing a Different Breed of Adherent." *New York Times,* September 29, 1986, p. 1. Lengthy report on the way "New Age" or alternative thought is working its way into the nation's cultural, religious, social, economic, and political life. Subjects range from new metaphysical religions, mediums, the occult, reincarnation, psychic healing, and "spirit guides" to psychological self-help and "human potential" groups.

Lindsey, Robert. "Teachings of 'Ramtha' Draw Hundreds West." *New York Times,* November 16, 1986, p. 1. Report on the migration of hundreds of people to the Pacific Northwest to devote themselves to teachings of long-dead, reincarnated spirits who they believe speak through human beings referred to as "channels." The main guru is a woman, J. Z. Knight, who says a 35,000-year-old-man, "Ramtha," uses her body to speak words of wisdom.

Marks, John, M.D., Curtis K. Church, and Guy Benrubi, M.D. "Effects of Barometric Pressure and Lunar Phases on Premature Rupture of the Membranes." *Journal of Reproductive Medicine,* 7:485-488. Analysis finds no evidence that premature rupture of the membranes leading to labor is affected by either barometric pressure (weather changes) or lunar phase.

Montgomery, Mark R. "Advances in Medical Fraud: Chelation Therapy Replaces Laetrile." *Journal of the Florida Medical Assocation,* 73 (9):681-685, September 1986. Report on illegitimate chelation therapy, "the next generation of medical sleight-of-hand." Author says it has all the classical hallmarks of quackery. Although chelation therapy can be a legitimate medical treatment, it is being distorted and marketed to an unsuspecting public.

Rae, Alastair. "Extrasensory Quantum Physics." *New Scientist,* Nov. 27, 1986, pp. 36-39. Excellent article by British physicist about the nonlocality feature of quantum physics and why it does not "explain" ESP. "As yet, there is no evidence of a link between quantum non-locality and ESP. The proponents of the supernatural have simply misunderstood what quantum physics is saying."

Sagan, Carl. "The Fine Art of Baloney Detection." *Parade,* February 1, pp. 10-11. Excellent article on pseudoscience and fallacious or fraudulent argument on the borders of science. Gives good advice on critical thinking—how not to be fooled by "bamboozle" and "proved or presumptive baloney." With sidebars on CSICOP and the SKEPTICAL INQUIRER ("cheerful, irreverent, constructive and often very funny"); James Randi ("He and his colleagues perform a courageous, essential social service for the rest of us"); cold reading; and uncritical thinking in politics.

Randi, James. "Taking It on Faith." *Penthouse,* December 1986, pp. 60 ff. Lively report on Randi's investigations into the tactics of W. V. Grant, Peter Popoff, and other television "faith-healers."

Stewart, Doug. "Wheels Go Round and Round, But Always Run Down." *Smithsonian,* November 1986, pp. 193-208. Report on inventors' quest for the grail of perpetual motion.

Stillings, Dennis. "Strip-Mining the Psyche." *Fate,* November 1986, pp. 93-96. Critical look at "consciousness" developer fads like positive visualization, channeling, neurolinguistic programming, and "making contact" with entities (such as Seth, Ramtha, extraterrestrials, or whatever). These techniques, says the author, "seem to be developing into major money-making schemes even for those who, under normal circumstances, couldn't dial a phone correctly."

Wagner, Michael. "Investigating the Paranormal." *Nature,* 323:664, October 23, 1986. Letter critical of David Marks's earlier article of same title (*Nature,* 320:119, 1986; see this column, *SI,* Summer 1986).

Walker, Iain, and John Dale. "Come on Mr. Geller, Who Do You Think You Are Fooling?" *The Mail on Sunday* (London), October 5, 1986, p. 13; "How Uri Bends the Truth About Big Names," *The Mail on Sunday,* October 12, 1986, p. 17; "Shut Up or Put Up, Mr. Geller," *The Mail on Sunday,* October 19, 1986, p. 9. Major investigation of Uri Geller's claims. The reporters give the side Geller doesn't. (See lead News and Comment item in this issue.)

Weston, Bonnie. " 'Stone Age Tribe' Discovery Now Suggested as Cave-Man Con." *San Diego Union,* November 30, 1986, p. A36. Another article on reports by some journalists and anthropologists that claims about the Tasaday people were a hoax.

Whybrow, Peter J. "Rare Controversy." *New Scientist,* September 4, 1986, p. 62. Strong complaint by British Museum paleontologist against Hoyle and Wickramasinghe's tactics and arguments alleging that the archaeopteryx fossil is a fraud. Whybrow and colleagues earlier persuasively put that claim to rest. (See also Kemp, above.)

Wingerson, Lois. "Ideas That Stick in the Mind." *New Scientist,* October 2, 1986, p. 56. Report on recent attempts to test Rupert Sheldrake's "morphogenetic field" hypothesis.

—*Kendrick Frazier*

Newspaper Clippings

We depend on our readers' sending in clippings from the print media to keep us informed of current happenings in the world of pseudoscience and the paranormal and to keep our reference library up to date.

When you see an article you feel is relevant, please cut it out, mark it with the date it appeared and the name of the publication, and send it to the CSICOP Library, Box 229, Buffalo, NY 14215.

Follow-up

Watson and the 'Hundredth Monkey Phenomenon'

I BEGAN investigating the "Hundredth Monkey Phenomenon" in August 1984 with a letter to Lyall Watson, the author of the "phenomenon," addressed in care of his publisher, Simon and Schuster. I asked for more information about the group consciousness of monkeys reported by Watson in *Lifetide.* Neither this nor a later letter to the publisher has ever received a reply. My study was published in the Summer 1985 SKEPTICAL INQUIRER. Boyce Rensberger, a *Washington Post* science writer, and subsequently a recipient of CSICOP's 1986 Responsibility in Journalism Award, picked up the story. He also approached Simon and Schuster, who declined to put him in touch with Watson. Rensberger's story ("Spud-Dunking Monkey Theory Debunked," *Washington Post,* July 6, 1985) quoted Watson's editor as saying that Watson "is a distinguished and eminent scholar who, I have to say, does have some weird ideas." No news there.

Watson has now broken the silence. Ted Schultz, an editor for *Whole Earth Review,* managed to contact him. According to Schultz, Watson was "quite happy to respond to Amundson's analysis of his monkey tale." The response was published, together with a reprint of my *SI* article, in the Fall 1986 "Fringes of Reason" issue of *Whole Earth Review.* (See review in *SI,* Winter 1986-87.) Although he begins with a swipe at "self-appointed committees for the suppression of curiosity," Watson deals "in good humor" with my critique of the Hundredth Monkey. My article was "lucid, amusing, and refreshingly free of the emotional dismissals" that, he says, CSICOP is prone to. I wish I could be proud of this distinction.

Watson continues: "I accept Amundson's analysis of the origin and evolution of the Hundredth Monkey without reservation. It is a metaphor of my own making, based—as he rightly suggests—on very slim evidence and a great deal of hearsay. I have never pretended otherwise. . . . I based none of my conclusions on the five sources Amundson uses to refute me. I was careful to describe the evidence for the phenomenon as strictly anecdotal and included citations in *Lifetide,* not to validate anything, but in accordance with my usual practice of providing tools, of giving access to useful background information."

It should be remembered that the "five sources Amundson uses to refute me" were the identical five sources that Watson provides as "tools" and "access" in his original discussion of the phenomenon.

Watson goes on to complain about my conclusion that the Hundredth Monkey Phenomenon does not exist. He still thinks the phenomenon is real, while (apparently) admitting that it didn't happen on Koshima. This is like claiming that the "Geller Effect" is real, while admitting that Uri Geller himself is a fraud. Well, okay. Show us a *real* example.

Watson is also unhappy about the description of his work as "pseudoscience." His only defense against this charge seems to concern his citations. We are told that they were given as "tools" and were not intended to validate the factual claims made. He admitted all along, he says, that the story was anecdotal. This is (approximately) a half-truth. Watson did admit in *Lifetide* that he had to "gather the rest of the story from personal anecdotes and bits of folklore." (This was because, he said, the scientists were afraid to publish the truth "for fear of ridicule.") He then *specifically stated* that certain crucial details were missing from the scientific reports. He went on to describe the events on Koshima, "improvising" the details. The miraculous results were stated in two sentences, followed by a citation reference.

We must first note that the details said by Watson to be missing *were not missing.* He falsely reported on the scientific evidence available—available, in fact, in his own citations. Watson's second defense is that his reference citations were not really documentation, but "tools."

The citations were presented in *exactly* the format used to provide documentation for factual claims, both in scientific and in informal writing. *Lifetide* is peppered with raised reference numbers, each following a factual statement made in the text. The *Chicago Manual of Style* refers to this format as "notes documenting the text, and corresponding to reference numbers in the text." Does Watson anywhere warn us that his citations do *not* document the text—that they actually *contradict* the text? Does he warn us that they are merely "tools"? No. We are told only that the raised numbers "refer to numbered items in the bibliography."

As an "eminent scholar" and "holder of degrees in anthropology, ethology, and marine biology" (*Whole Earth Review*'s description), Watson must be assumed to understand the use of scientific citations. The meaning of a reference citation is not something each author simply invents for himself. It does not mean "documentation" for some writers and "tools" for others. Watson uses a format that implies documented support for a factual claim. He now says that he didn't really mean it that way.

I submit that this technique is *pseudoscientific* in the strictest sense. It falsely presents the appearance of science. Watson could have admitted that he made a mistake in his citations (or that he never read them in the first place). Instead he excuses himself by saying that the references were merely "tools." They just *looked* like scholarly citations.

Watson owes an apology to the thousands of people who took his claims to be reports of fact, rather than "hearsay" and "anecdotes." None of Watson's published commentators thought he was presenting "hearsay" about potato-washing monkeys. If *I* made a mistake by taking him seriously, so did everyone else. Let it be known that the hundreds of scientific-looking citations in Watson's books are not intended to support his factual claims. They are "tools." They look, for all the world, like scientific documentation. But it is all an illusion.

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Clearing the Air About Ions

I READ "Atmospheric Electricity, Ions, and Pseudoscience" by Hans Dolezalek (*SI*, Fall 1986) with a great deal of interest, because I am sometimes asked to review manuscripts that present empirical findings in this area. If I had been asked to review this article, I would have called the author's and editor's attention to the fact that it contains a number of errors.

To begin with, it suggested that Kelly, Rotton, and Culver (1985-86, p. 137) erred when they wrote, "positive ions are more prevalent when the moon is full." As the author notes, Kelly et al. based this assertion on two published sources (Campbell 1982; Garzino 1982). Unfortunately, none of the references in Dolezalek's article deals with this issue: Are there or aren't there more ions in the earth's atmosphere when the moon is full? To find out, I wrote the author, on July 21, 1986, and received the following answer in a letter dated July 26, 1986:

> You are asking for *empirical evidence.* In the case under consideration, the empirical evidence is fully supplied by our knowledge on the physics of small ions in the human biosphere and the forces exerted by phases of the moon. [*Italics in original.*]

Because my "knowledge on the physics of small ions" is limited, I searched through King's (1978) annotated bibliography on air ions, which has recently been updated to include articles published through 1980, and had my librarian do a computer search of the literature. This review leads me to conclude that my coauthors and I should have written, "positive ions *may or may not be* more prevalent when the moon is full." Nobody seems to know the answer to the question I posed.

Moving onto more substantive issues, readers have been asked to accept what amounts to hearsay: "I have heard that about 10 million ion generators are sold each year in this country" (p. 58). That the author places credence in this estimate is evidenced by the fact that he tries to draw a conclusion from it: "The production of 10 million air ion generators per year shows that large commercial interests are involved." If I had been asked to comment on this article before it was published, I would have made sure that the author received a copy of an essay in *Current Contents* by Eugene Garfield (1979). Garfield took the trouble to call a manufacturer and ask for an estimate of generator sales. The manufacturer's (admittedly dated) estimate was 30,000 to 70,000 per year.

Had Dolezalek read Garfield's excellent and generally skeptical review of research on air ions and behavior, I doubt that he would have written, "The U.S. Food and Drug Administration [FDA] does not allow any mentioning of alleged positive health effects of machines producing negative ions because that would violate the principle of truth in advertising." In 1978, the head of the FDA's Bureau of Medical Devices stated that his division had "never tested or conducted clinical studies to determine whether the claims made for ionizers are true" (Garfield 1979, p. 10). The FDA's position on this issue can be traced to the 1950s, when some firms claimed that their machines could cure everything from heart disease to cancer and, as Kelly et al. (1985-86) noted, it was found that early models produced harmful levels of ozone.

Another questionable conclusion appears in Dolezalek's article: "The ion generators generally create a highly unnatural environment because they produce a much

higher ion concentration than is found in nature. This is not without a certain risk" (p. 58). We are not told what the risk might be. However, if the author had consulted the references my coauthors and I cited (specifically, Baron et al. 1985), he would have found not only that negative ions lead individuals to report that they feel more energetic (i.e., aroused), but that there is also some reason to believe that ion-generated arousal increases the probability of aggressive behavior. However, this only occurs after coronary-prone (Type A) subjects are insulted and, as Kelly et al. noted, "individuals are exposed to very high concentrations of ions in a controlled (i.e., laboratory) setting" (1985-86, p. 137).

Because I am sometimes asked to review manuscripts on air ions and behavior, I checked the references provided in the note at the end of Dolezalek's article. Only one of them dealt with the effects of "atmospheric electricity (including ions) on biological entities and human well-being." The one that did (an article by P. Kröling) devoted no more than 13 lines to the "effects of air ions on man." It does not reference empirical studies published after 1978. If I had reviewed this manuscript, I would have felt obliged to direct the author to more recent references (e.g., Baron et al. 1985; Hawkins 1981; Morton and Kershner 1984) and given him an address for obtaining copies of manuscripts accepted for publication (Baron n.d. [a]; n.d. [b].[1]

One of Dolezalek's references is to the proceedings of an international conference at which, we are told, "there has never been a paper presented dealing with the alleged atmospheric (including ion) effects on biological specimens" (p. 57). However, in the proceedings' summary (Dolezalek and Reiter 1977, p. 807), refers to an address given by Helmut Landsberg, "an outstanding expert on meteorology (in its broadest definition). . . . For the first time in this series of conferences, a speaker was invited who was not from the immediate field. . . . [His address] is recommended reading." To be honest, Landsberg's was the only name that I recognized, having been introduced to research on air ions and health through his frequently cited book on *Weather and Health* (1969). I regret that space does not permit me to quote more than a few lines from Landsberg's address, delivered *before* the "special conferences" mentioned in Dolezalek's article.

> As a final puzzle let me mention one that requires intensive cooperative research with biologists. This concerns the effects of atmospheric electric phenomena on biological processes. Such interactions doubtlessly exist. . . .
>
> We are here also being confronted by a new source of a man-made environmental disturbance that has been dubbed "electromagnetic pollution." Experiments with animals have shown effects of various types of electric field on vision, induction of lethargy, emotional disorders and even blood composition. . . . This is certainly an unexplored corner with a very high intellectual challenge. [Landsberg 1977, p. 802]

Let me conclude by stating that my purpose has been to correct what I consider to be obvious errors, not to lend support to those who have made outrageous claims for ion generators. Unfortunately, the latter will probably be the ones who cite Dolezalek's article—as an example of the less than fair and accurate treatment their claims sometimes receive—making it more difficult for those of us who try to base our criticisms on empirical evidence.

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Note

1. Copies of material in press may be obtained from R. A. Baron, Dept. of Psychological Sciences, Purdue University, West Lafayette, IN 47907.

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New Skeptics Groups

Since the "Expansion of Local Groups" advertisement appeared in recent issues of the SKEPTICAL INQUIRER, many people have come forward who want to start independent, autonomous groups with aims similar to CSICOP's in their areas, their states, or their countries.

We have prepared a 64-page manual to assist skeptics organize groups.

If you live in a place *not* covered by one of the groups listed on pages 319-320 of this issue and would like to assist in the formation of a local group, please fill out and return the form below. We will send potential convenors a copy of the manual and assist in organizing new groups.

If you live in one of the states or countries that *is* listed and are not involved with the local group, please complete the form below and send it directly to the group in your area.

Mark Plummer
Acting Executive Director
CSICOP
Box 229, Buffalo, NY 14215-0229

Name _____

Address _____

City _____

State/Country _____ Zip/Postal Code _____

Phone: *(home)* _____ *(office)* _____

Occupation _____

Interests/Background/Expertise _____

_____

If a local group were formed in your area, would you like to be: ☐ organizer/convenor, ☐ group committee member, ☐ group member, ☐ newsletter editor, ☐ supporter, ☐ consultant: special area(s) _____

From Our Readers

The letters column is a forum for views on matters raised in previous issues. Letters are more likely to be published if they are brief and typed double-spaced. They may be edited for space and clarity.

Ghostbusting

Robert Baker's article on a "modern exorcism" (*SI*, Fall 1986) addresses a very real problem in society (i.e., some people have the *feeling* that they are tormented by ghosts or spirits; essentially this is a psychotherapy problem). But was his report good science? We are told that his methods are effective, yet he gives no indication of how many times he has tried them. Further, we are given no idea whether he did any followup of his cases. If his methods didn't work, perhaps his clients concluded that he could be of no help to them and simply failed to tell him.

George P. Hansen
Cranbury, N.J.

Robert A. Baker replies:

Mr. Hansen is correct in noting that the feeling of being tormented by ghosts or spirits is a very real problem. Both clinical psychologists and psychiatrists are familiar with haunted clients, although most people who see ghosts are not so disturbed by these unconscious projections and misperceptions that they wind up in professional hands. Cases of possession and bedevilment by demons are still relatively rare and when they do appear they usually attract a great deal of media attention and notoriety. With regard to such anomalies, most psychologists have a Murphy's Law of psychopathology: If anything can *go wrong with the human mind, it* will *go wrong.*

Although I treated the problem rather lightly in my article, it is most certainly a very *serious matter to those under attack. One of the classical authorities in this matter, the late psychoanalyst Nandor Fodor, a few years ago published case studies of haunted people. The best of these are* The Haunted Mind *(1959),* The Unaccountable *(1968), and* Between Two Worlds *(1969). In his work he uses psychoanalytical and desensitization procedures to allay the obsessions and exorcise the demons. His procedures, unfortunately, take months—even years—before they become fully effective. In his defense, however, it should be noted that his clients were quite seriously disturbed and in need of intensive treatment.*

Conversely, most of my clients (5 out of 8), other than occasionally seeing a haunt, were well-adjusted, normally functioning adults who did not need long-term psychotherapy, hospitalization, or medication. After my intervention the few (3 out of 8) who did show serious neuroses or psychotic symptoms I referred to my specialist friends. The majority of my clients suffered from no more than bad cases of misperception and/or superstition, and for these relatively minor problems my recommended implosive techniques proved quite effective. With regard to followup, this I routinely do every six weeks and every six months. In the case of DF, my most recent case, he and his wife have now gone unmolested for 18 months. Over

this time he has maintained contact not only to express his gratitude but also to tell me of other people needing my help. Some of my clients (2 out of 5) required repeated visits and reassurance, along with desensitization and other fear-fighting techniques, before their obsessions were lost.

The place for the type of case study Hansen requests is in the psychological and psychiatric journals. Here he can find a number of studies of "fantasy-prone" personalities. These are people who have out-of-body experiences, take rides on UFOs, interview extraterrestrials, and in general have difficulty distinguishing fantasy from reality. They also frequently see demons, ghosts, and the little-man-upon-the-stair. It is estimated they comprise 6 to 8 percent of the general population and they live quite normal and productive lives, though at times they may be considered a little odd by friends, neighbors, and acquaintances.

Finally, as for my credentials, I am a Fellow of the American Psychological Association, licensed in Kentucky in both industrial and experimental psychology, a former clinical practitioner with more than a hundred professional publications, and a lifelong student of anomalistic psychology. Along with FDR, I sincerely believe that "the only thing we have to fear is Fear itself." Mr. Hansen's skepticism is quite appropriate and to be commended. As for whether or not my methods are effective, the proof is in the eating. Try them and see.

Dentistry and pseudoscience

I read with interest "Dentistry and Pseudoscience" (*SI*, Fall 1986). Dr. Dodes made many cogent remarks concerning the pseudoscience practiced by some dentists in the United States. This has been and probably will be a basic problem in the field of dentistry because of many of the factors that Dr. Dodes commented upon. However, he makes the same mistake concerning temporomandibular joint problems as the one he alludes to in his article.

Yes, there are quite a few practitioners, without any rationale whatsoever, who are involved in treating patients with temporomandibular joint disorders. For Dr. Dodes to say that jaw exercises, moist heat, and anti-inflammatory and muscle-relaxing drugs are equally effective as other modalities of TMJ treatment without defining what the problems are is frankly quite ludicrous. We have a great deal to learn about temporomandibular joint problems and have made great progress in their understanding. Articles like Dr. Dodes's do not help clarify the situation and only contribute to the confusion that he is trying to rectify. He fails to define the problem it causes and various treatment modalities.

John L. Krump, DDS
Clackamas, Ore.

John E. Dodes, DDS, replies:

I am glad Dr. Krump agrees that there is an awful lot of strange and unscientific dentistry being promoted in the United States. I am sorry he misunderstood my comments about TMJ therapy. They only apply to TMJ based on "kinesiology."

It was not my intention to denigrate all therapies relating to "jaw problems," only to specifically call attention to the pseudoscientific practice of "kinesiology." I am sure he will agree that any TMJ problem that responds to treatment based upon such a spurious diagnostic test would be better handled with the least invasive and most conservative treatment available.

Tommy Gold's theories

I enjoy the SKEPTICAL INQUIRER, particularly the columns by Martin Gardner. However, in his Fall 1986 column, "The Unorthodox Conjectures of Tommy Gold," there are some statements regarding Gold's lunar work that I feel are misleading to the lay reader.

Mr. Gardner refers to Gold's lunar guesses as "half-right," whereas I believe

that the phrase "almost totally wrong" is more appropriate. Gold predicted in the pre-Apollo era that the lunar maria (dark areas) were large "dust bowls," i.e., that these large depressions served to accumulate fine powder, levitated by electrostatic force and transported by gravity from the highlands into topographic lows. He further asserted that the moon was a body shaped totally by cold accretion and that large-scale melting and chemical differentiation never occurred (a perfectly respectable position in those days, shared by Harold Urey, among others).

Gardner then says that Gold's prediction about the sinking of spacecraft in thick layers of dust didn't occur, but "neither were astronomers right who expected the moon's crust to be solid rock." The differences between *crust* and *surface* are confused here. To my knowledge, no one predicted in the pre-Apollo era that the *surface* of the Moon would be solid rock; this was well known before any lunar missions from the properties of light reflected from the moon, which indicate a ground-up, powdery surface layer. The impact bombardment of the moon over geologic time has completely pulverized the surface rocks into a chaotic mass of material called the "regolith." The production of the regolith was well understood before Apollo 11, based on analysis of images returned by the unmanned precursor missions (mostly Surveyor). The *crust* proper, which comprises roughly the outer 70 kilometers of the moon, *is* in fact rock, albeit fractured and broken by impacts. Some of these impacts formed craters more than 1,000 km in diameter. The evidence from lunar sample analysis and remote-sensing strongly indicates that the early moon underwent intensive melting (possibly on a global scale) to form the crust and that partial melting episodes continued to produce volcanic eruptions for at least 1.5 billion years after the moon formed.

It is no crime in science to be wrong, if you are willing to revise your ideas when the data so direct. The statement that I find most offensive in Mr. Gardner's article is that "[Gold] is always (unlike cranks) open to changing his views when evidence turns against them." To my knowledge, Gold has not done this regarding the moon. In what I believe to be his last published paper on the moon (*Proc. Royal Society London,* A285, 1977), Gold essentially rehashes all of his (pre-Apollo) views on lunar evolution and totally ignores the overwhelming evidence accrued during post-Apollo analysis for early lunar differentiation (melting) and subsequent volcanism. In contrast, and to his credit, Harold Urey, a staunch advocate of a cold, primordial moon, publicly proclaimed that his pre-Apollo ideas about the moon were wrong. I have little doubt that, no matter what is found in the Swedish drill-hole, Gold will see the results as confirmation of his ideas.

Paul D. Spudis
Flagstaff, Ariz.

I have long thought that Professor Thomas Gold's pronouncements form an excellent example of the lack of clear boundary between science and nonscience; I therefore was amused to see Martin Gardner's column on Dr. Gold's speculations. Unfortunately, however, I think that Mr. Gardner attaches more weight to Dr. Gold's speculations than the record warrants, and indeed there seem to be some points in Dr. Gold's career for the skeptical community to ponder.

It *is* good to know that Dr. Gold has occasionally connected with his speculations; I was unaware, for example, that the current conventional wisdom on pulsars is due to him. On the other hand, the phenomenon of "shotgun prediction" is well known, as documented so well in *SI* itself, and one might expect a prediction to connect once in a while on that basis alone.

The part of Dr. Gold's record of which I'm aware is much worse. His "deep lunar dust" hypothesis was not nearly so soundly based as Gardner implies, and I moreover am one of those geologists who feel that his abiogenic oil theory is probably "utter nonsense." . . .

It seems even less soundly based than his lunar dust speculations. Quite apart from the vast literature, based on empirical data, on the occurrence of oil, which Dr. Gold ignores completely, there are also geochemical constraints on oil formation. . . . Quite apart from the evidence Gold has had to ignore to advance his theory, he has not put money where his mouth is. If he is correct, his idea would literally be worth billions. But it is very easy to make media-worthy pronouncements from the security of a tenured faculty position; much more difficult to actually take the risk of acting on them. It would be easier to take his idea a bit more seriously if it seemed he did too. As it is, it merely seems a device to get featured prominently in the forums far removed from the professional scientific literature, such as the *Atlantic.* (As pointed out repeatedly by *SI,* moreover, it is typical of fringe science that it is presented in the popular press rather than in refereed journals.) . . .

Now for some philosophy. I suppose I am particularly unimpressed with Gold's presentations because I have been involved in the rocky and thankless task of actually taking an academic technique and making it into an oil-industry tool. But this leads to my last point: economic applications of science as a tool of skepticism. Applications give great urgency to the question "Does it *work?*" Experiments can often be argued around or interpreted in various ways. It is much more difficult to do so when a stark economic objective is present. . . . The large economic outlay that can hinge on the correctness of one's interpretations furnishes special motivation to ensure the interpretation is correct. If you're going to spend several million dollars drilling a well you want it to be in the right place. The economic application forces a "real-world" evaluation of *what* the discrepancy represents. It is impossible to take refuge in might-be's and go running back to the National Science Foundation for more funding. . . .

Does it *work?* That should be a primary question of skeptics. The jury is still out on Dr. Gold's abiogenic oil idea, but certainly his track record—and his method of presentation—are not such as to inspire confidence in his theory. In any event, the economic significance of his idea is such that it is not likely to remain an academic dispute much longer.

Stephen L. Gillett
Consulting Geologist
Pasco, Wash.

Martin Gardner replies:

On all counts I yield to Paul Spudis and Stephen Gillett, who obviously know far more than I about the moon's geology and the origin of oil. I tried to lean over backward to give Thomas Gold the benefit of the doubt, basing my remarks about his moon dust prediction on the account given by David Osborne in his cover story on Gold in the Atlantic *(February 1986). I am now convinced that I should have distrusted Osborne and given more space to Gold's critics, who surely outnumbered his defenders by a wide margin.*

UFOs: Advocacy or conspiracy?

Since James E. McDonald is no longer around to defend himself, several points need to be made to balance the picture Phil Klass paints of the University of Colorado UFO project and McDonald's actions in relation to it (*SI,* Summer 1986). If Klass really believes what he says, then he betrays considerable ignorance both of scientific method and of the daily workings of science. McDonald's actions—far from being a "conspiracy" or "subversive"—are entirely understandable in terms of "scientific advocacy," just as we see other scientists willing to take unpopular stands on touchy political/scientific issues like Nuclear Winter, Star Wars, and Agent Orange. It matters little for present purposes whether the scientist ultimately is "right" or "wrong." More power to any scientist (especially one of McDonald's stature) who has the courage to stand up and fight for what he is persuaded is "right." Obviously, there is a lot of "gray" in the cited analogical cases and in UFOs.

I similarly admire some of the CSICOP scientists who are willing to take positions on controversial issues and argue them rationally.

The point is that there is no need (and no excuse) for Klass to invoke conspiracies and alleged misbehavior on McDonald's part just because Klass thinks he was "wrong." I see no "conspiracy" in the opposite direction either; the Colorado project failed for other reasons. Nor do I see anything wrong whatsoever with McDonald's attempts to convince scientists (including the Colorado scientists) that UFOs are something deserving of careful study as a potentially very important problem, or in attempting to persuade the scientists "not to reject [UFO] claims on a priori grounds, antecedent to inquiry, but rather [to examine] them objectively and carefully." Such advocacy does not mean a suspension of scientific principles at all. In fact, McDonald constantly sought to obtain critiques from his colleagues, and his whole effort was directed at trying to ensure a fair hearing for UFOs in the face of clear and obvious "anti-UFO" biases.

The so-called Condon Report (though Condon personally had very little to do with it) concluded that there was nothing of scientific interest in UFO reports. Leaving aside all arguments about the validity of the methods used and the thoroughness of the study, that conclusion obviously pleased Klass. Therefore, he is willing to perform contortions and do backflips in defense of the Colorado project (and to malign its critics). His blatant double standard about disqualifications on the grounds of "preconceived positions" is particularly noteworthy. Saunders's "interest" was disqualifying; Condon's repeated public statements denigrating the subject as a lot of nonsense—prior to any investigation—were not. As the alleged scientific director of the project, Condon's remarks were inexcusable.

As one further comment on Condon's "objectivity," I personally hand-delivered to him a 2- to 3-inch-thick investigation report on a major UFO case that had occurred just prior to establishment of the project, prepared by one of our best investigators, on the staff of a northeast university. The case had been highly publicized and had caused repercussions in Congress. I expected to at least receive his thanks for presenting him with a carefully investigated, substantial case that included "meaty" data for scientific consideration. Instead, he tossed the report aside and regaled me with "contactee" stories and joked about UFOs. The case is not even discussed in the Condon Report, nor were hundreds of other substantial NICAP cases that I caused to be brought to the project's attention.

To my everlasting regret, I remained optimistic that Condon's biases could be overcome once he became aware of the data we had to offer, and I continued to support the project. Why did I feel that way? Because I had had private meetings with other members of the project who had displayed a truly objective approach to the subject and was impressed by their open-minded attitudes. These were not UFO "believers" in the Klassic sense, but people who were quite willing to take a look at the evidence and see where it led. The tragedy of the Colorado UFO project is that these middle-of-the-roaders got trampled on as events unfolded and their moderate views did not prevail.

Richard H. Hall
Brentwood, Md.

Richard Hall is director of publications for the Mutual UFO Network and was acting director of NICAP at the time of the Condon UFO study.

Philip J. Klass replies:

At no place in my article did I criticize McDonald for his "scientific advocacy" and certainly not for his "open advocacy" before the Condon/Colorado group on the two occasions he was invited to present his views and his evidence. McDonald's covert communications with certain members of the Colorado team and his covert efforts to publicly discredit

the entire Colorado investigation on the basis of a single word of ambiguous meaning written by Robert Low before the project began strike me as something other than "scientific advocacy."

As to whether McDonald's covert acts amount to a "conspiracy," my Random House dictionary defines the word as "the act of conspiring," and defines the word "conspire" to mean "to agree together, especially secretly. to do something wrong, evil or illegal." Clearly what is "evil" or "wrong" is in the eye of the beholder, and my standards differ from those of Hall. But this is hardly surprising: for more than 20 years our views on UFOs have differed sharply.

Philip Klass maintains that J. E. McDonald was the author of a "well-orchestrated plot to discredit" the principal investigators of the Condon study, a plot that centered on the public release of a private memo coupled with a congressional "UFO Symposium." The evidence for this plot comes almost entirely from an unpublished Ph.D. thesis by Paul McCarthy.

As I read it, McDonald knew of the memo on December 12, 1967; Klass maintains that he learned of it much earlier, based on his apparently presumed "very close relationship" with people who had access to it in August. On December 28, McDonald wrote to another UFOlogist expressing concern with the Condon study and plans for a confrontation. A month later, McDonald confronted Low, the author of the memo, in a letter. This resulted in the firing or resignation of the three UFO sympathizers on the Condon study. Within days after the firing, McDonald sent the memo to the president of the National Academy of Sciences and to a contract manager at the Office of Naval Research. Some (five) months later, a congressman sympathetic to McDonald arranged for a pro-UFO symposium that a pro-UFO author used as the basis for a pro-UFO book.

Those seem to be the bones of the story, and I see no *evidence* of conspiracy in them. Disagreements and shady ethics, yes; and McDonald seems to have taken a scientific argument to the public after he saw his views denied input into the study. (It seems appropriately so, but he would have a different opinion.) There was a "secret" (from whom?) meeting; but McDonald waited until a sympathetic outsider (Hynek) was gone before mentioning the Low memo, and McDonald's supposed sources expressed surprise that he knew about the memo. This could be interpreted as clandestine plotting and coverup, but there are certainly more benign ways of looking at it.

Jim Moore
Anthropology Department
Univ. of California, San Diego
La Jolla, Calif.

Philip J. Klass replies:

Reader Moore is entitled to interpret the facts presented in my article as he wishes, but his summary is not an especially accurate one—even after making allowance for its brevity. I would wish that he might read the article more carefully and also consult a good dictionary for the meanings of "conspiracy."

Magic and skepticism

Robert A. Steiner takes his audience at the CSICOP convention to task ("Confessions of a Magician," *SI,* Fall 1986) for not realizing he had used magic rather than science in a card-reading demonstration. Steiner pretended he was "reading" body language cues as the famous horse Clever Hans did, when in fact he was merely tricking the audience. And he wonders why they weren't skeptical.

Well, had Steiner read Robert Rosenthal's edition of Oskar Pfungst's book *Clever Hans,* perhaps Steiner would have understood this lack of skepticism, at least on the part of members of the audience who were familiar with Pfungst's research. Pfungst, of course, was the psychology graduate student who determined that Clever Hans was responding to sub-

tle body language cues given by his questioners and was not reading their minds. However, Pfungst went much further in his study of this phenomenon. In Chapter 4 of his book, he describes a series of laboratory experiments in which he himself attempted to "guess the thoughts" of various subjects in forced-choice situations similar to the one Steiner used in his demonstration. Pfungst was able to guess the correct answer about 80 percent of the time and often was able to identify the body-language cue given by his subjects. Furthermore, Pfungst was able to do so even when his subjects knew what he was doing and deliberately tried to control their actions!

Steiner claims that the *speed* at which he "read the cues" should have alerted his audience that he was using magic. However, in Chapter 1 of the fifth edition of my text *Understanding Human Behavior,* I describe a severely brain-damaged girl who was able to read body-language cues given by her adopted mother (and others) at about the same speed that Steiner presumably would have to use in his presentation.

Steiner merely demonstrated that, when you use magic to accomplish what we know can be accomplished using science, people aren't skeptical. But why should they be?

I nominate Oskar Pfungst as the Patron Saint of CSICOP and urge Steiner and all others associated with CSICOP to read his book if they haven't done so already.

James V. McConnell
Dept. of Psychology
Univ. of Michigan
Ann Arbor, Mich.

Robert Steiner replies:

Dr. McConnell's argument is a classic example of begging the question. He states: "Steiner merely demonstrated that, when you use magic to accomplish what we know can be accomplished using science, people aren't skeptical." The fundamental question at issue is: Do we know *that this can be accomplished using science?*

The fact that Pfungst could "play Clever Hans" and score well does not prove the case. I have done so myself, but not at the speed I used at the CSICOP presentation.

As detailed in the article, each of three people would have had to hear, understand, and react in time-spans of less than one-quarter of one second. While reciting the 52 cards at that speed, I would have had to simultaneously read precisely the split-second bodily reactions of three people in various parts of the room. McConnell offers one carefully researched, laboratory tested, lone, isolated example of a child "reading" her mother (and others). Does his example replicate my randomly choosing three unresearched, untested strangers in a room of 800 persons? Does his solitary example allow him to know *that my presentation could have been accomplished by science?*

What ever happened to Occam's Razor? Is the only *reasonable assumption of the folks in the audience the uncritical acceptance of my having the highly improbable, never-proven-at-this-speed skill? I submit that the skeptics should have questioned the proceedings. (Incidentally, a few did.)*

From Agassiz to parapsychology

In his marvelous collection of essays, *Hen's Teeth and Horse's Toes,* Stephen Jay Gould mentions the strange case of Louis Agassiz, the great nineteenth-century biologist who refused to accept Darwin's evolutionary theory, in spite of the evidence in its favor that was slowly accumulating. Not even a voyage to the Galapagos islands, the perfect example of "evolution in action," could make him change his mind.

When reading this, I was struck by a remarkable similarity between Agassiz's view with regard to Darwin's theory and the attitude of a great many parapsychologists concerning the authenticity of some famous mediums like D. D. Home, Florence Cook, and Eusapia Palladino.

Although skeptical witnesses clearly demonstrated that these wonderworkers fraudulently produced their spectacular phenomena, parapsychologists refused to accept these charges. While they admitted that the "psychics" resorted to trickery when "conditions were loose," they nevertheless continued to believe that Home and company were able to produce genuine effects when control measures were tightened. Now it's a fact that most contemporary parapsychologists of the younger generation no longer take these old cases as evidence for the existence of psi. Their older colleagues on the other hand still think that their predecessors were excellent observers and that everything they reported was actually happening. In my opinion there are two reasons for this attitude:

1. Once one has formed an opinion about something, it's extremely difficult to change that opinion, no matter how strong the evidence against it (cf. Agassiz).

2. The results of experimental contemporary psi-research are only interesting from a statistical viewpoint and are criticized by most skeptics; so the older parapsychologists again turn to the spectacular feats of the "great mediums," emphasizing the rigorous controls that were applied by "eminent scientists," and hope that the critics will be impressed by such "striking evidence" of paranormal powers.

Werner Eeman
Lede, Belgium

A first-hand view

Congratulations and thank you for an enlightening magazine. I used to be an astrologer—semi-professional—and a faith-healer. It is from this perspective that I recount some of the psychological dangers I encountered in my fascination with the occult.

I was in my late teens, in the early 1970s, when I moved to the San Francisco Bay Area to practice my newly acquired broadcasting skills. My cousin/housemate had a library filled with every occult subject imaginable. She was obsessed by talk-show interviews of psychics and astrologers. Soon my passive, very open mind latched onto astrology, numerology, and Tarot. I was doing people's charts. I felt very happy, rewarded, and Christian.

Sometime later, I attended some speeches by Betty Bethards of the "Inner Light Foundation" and got hooked on healing and reading auras. I studied and read everything I could get my hands on. All the while I was being encouraged by my cousin and her circle of believers. I was intoxicated by all the attention and the new friendships.

One thing bothered me. Everyone was simply *too nice.* They rarely showed any anger or displeasure. If someone suffered a pitfall or setback, "It was meant to be." I did experience anger, but was told to channel it into positive energy. It became increasingly difficult to "channel my anger." So I packed my bags and moved to the Midwest to pursue my radio career.

After several years, I neglected my astrology, stopped trying to heal people, and stopped reading auras. The astrology, numerology, and Tarot had become an addiction to my introverted personality.

In autumn of 1985 I made a clean break from astrology and the rest by throwing the book in the trash. I've never felt better in my life. This summer I responded to your direct-mail advertisement for a subscription to the SKEPTICAL INQUIRER. This has been one of the best investments I ever made. I read it from cover to cover and use it as a reference.

My summer vacation travel last year took me back to California. Two days spent with my cousin and company were like returning backward in time. I left the Bay Area saddened that she has not grown away from her delusions. I also noticed a new resentment about wasting all that valuable time of my late teens and twenties. It was a costly diversion in both mind and vocation. Thank you for helping me catch up.

J. Alan Johnson
Norfolk, Neb.

Local, Regional, and National Groups

The local, regional, and national groups listed below have aims similar to those of CSICOP and work in cooperation with CSICOP but are independent and autonomous. They are not affiliated with CSICOP, and representatives of these groups cannot speak on behalf of CSICOP

AUSTRALIA
National: Australian Skeptics, Barry Williams, Chairman, P.O. Box 575, Manly, N.S.W. 2095.
Regional:
Australian Capital Territory, P.O. Box 1, Cook, ACT, 2614.
Queensland, 18 Noreen Street, Chapel Hill, Queensland, 4069.
South Australia, P.O. Box 91, Magill, S.A., 5072.
Victoria, P.O. Box 1555P, Melbourne, Vic., 3001.
West Australia, 25 Headingly Road, Kalamunda, W.A., 6076.

BELGIUM
Committee Para, J. Dommanget, Observatoire Royal de Belgique, Avenue Circulaire 3, B-1180 Brussels.

CANADA
National: James E. Alcock, Chairman, Glendon College, York Univ., 2275 Bayview Avenue, Toronto, Ontario.
Regional:
Ontario Skeptics, Henry Gordon, Chairman, P.O. Box 686, Station Z, Toronto, Ontario M6J 3S2.

ECUADOR
P. Schenkel, Casila 6064, C.C.I., Quito.

FRANCE
Comité Français pour l'Etude des Phénomènes Paranormaux, Maurice Gross and Yves Galifret, 16 Rue de l'Ecole Polytechnique, Paris 5.

GREAT BRITAIN
Michael J. Hutchinson, 10 Crescent View, Loughton, Essex IG10 4PZ.

MEXICO
Mario Mendez-Acosta, Apartado Postal 19-546, Mexico 03900, D.F.

NEW ZEALAND
New Zealand Skeptics, Chairman, Dr. Denis Dutton, University of Canterbury, Christchurch.

NORWAY
Jan S. Krogh, Norwegian Institute of Scientific Research and Enlightenment, P.O. Box 990, N-9401, Harstad.

SPAIN
Luis Alfonso Gámez Dominguez, el Almirante A. Gaztañeta, 1-5º D. 48012 Bilbao.

SWEDEN
Sven Ove Hansson, Box 185, 101 22, Stockholm 1.

UNITED STATES OF AMERICA

Arizona
Tucson Skeptical Society (TUSKS), Ken Morse and James McGaha, Co-chairmen, 2509 N. Campbell Ave., Suite #16, Tucson, AZ 85719.

California
Bay Area Skeptics, Robert Sheaffer, Chairman, P.O. Box 60, Concord, CA 94522-0060.
Sacramento Skeptics Society, Terry Sandbek, 4095 Bridge St., Fair Oaks, CA 95628.
San Diego Skeptics, Ernie Ernisee, Secretary, Box 17566, San Diego, CA 92117.
Southern California Skeptics, P.O. Box 5523, Pasadena, CA 91107.

Colorado
Colorado Organization for a Rational Alternative to Pseudoscience (CO-RAP), Béla Scheiber, President, P.O. Box 7277, Boulder, CO 80306.

Local, Regional, and National Groups (cont'd)

Delaware
See District of Columbia.

District of Columbia
The Committee for Scientific Inquiry of the National Capital Area (CSI/NCA), Sean O'Neill, Chairman, P.O. Box 753, Annandale, VA 22003-9998.

Florida
Sunshine State Skeptics, Humberto Ruiz, 10753 S.W. 104th Street, Miami, FL 33176.

Hawaii
Hawaii Skeptics, Kurt Butler and Alicia Leonhard, Directors, P.O. Box 1077, Haleiwa, HI 96712.

Illinois
Central Illinois Skeptics, Andrew Skolnick, Chairman, 905 S. Lierman, #63, Urbana, IL 61801.
Midwest Committee for Rational Inquiry, Contact person, Sandy Smolinsky, P.O. Box 268375, Chicago, IL 60626.

Kansas
Verle Muhrer, 2658 East 7th, Kansas City, MO 64124.

Maryland
See District of Columbia.

Michigan
Detroit Association for Rational Enquiry (DARE), Contact person, G. L. Ellery, P.O. Box 19580, Detroit, MI 48219.

Minnesota
Minnesota Skeptics, Robert W. McCoy, 549 Turnpike Rd., Golden Valley, MN 55416.

New York
Western New York Skeptics, Barry Karr, Chairman, 3159 Bailey Ave., Buffalo, NY 14215.

Ohio
South Shore Skeptics. Page Stephens, Box 5083, Cleveland, OH 44101

Oregon-Idaho
Northwest Skeptics, Oregon-Idaho Coordinator, P.O. Box 5027, Beaverton, OR 97007.

Pennsylvania
Paranormal Investigating Committee of Pittsburgh (PICP), Richard Busch, Chairman, 5841 Morrowfield Ave., #302, Pittsburgh, PA 15217.

Texas
Austin Society to Oppose Pseudoscience (A-STOP), Lawrence Cranberg, President, P.O. Box 3446, Austin, TX 78764.
Dallas Society to Oppose Pseudoscience (D-STOP), James P. Smith, Science Div. of Brookhaven College, Dallas, TX 75254.
Houston Society to Oppose Pseudoscience (H-STOP), David Smith, Chairman, P.O. Box 541314, Houston, TX 77254.

Washington
Northwest Skeptics, Michael R. Dennett, Chairman, Washington Coordinator, 4927 SW 324th Place, Federal Way, WA 98023.

West Virginia
Committee for Research, Education, and Science Over Nonsense (REASON), Dr. Donald Chesik, Chairperson, Dept. of Psychology, Marshall University, Huntington, WV 25701.

Wisconsin
Skeptics of Milwaukee, Len Shore, 3489 N. Hackett Ave., Milwaukee, WI 53211.

The Committee for the Scientific Investigation of Claims of the Paranormal

Paul Kurtz, Chairman

Scientific and Technical Consultants

William Sims Bainbridge, professor of sociology, University of Washington, Seattle. **Gary Bauslaugh,** dean of technical and academic education and professor of chemistry, Malaspina College, Nanaimo, British Columbia, Canada. **Richard E. Berendzen,** professor of astronomy, president, American University, Washington, D.C. **Barry L. Beyerstein,** professor of psychology, Simon Fraser University, Burnaby, British Columbia, Canada. **Vern Bullough,** dean of natural and social sciences, SUNY College at Buffalo. **Richard Busch,** musician and magician, Pittsburgh, Pa. **Charles J. Cazeau,** geologist, Tempe, Arizona. **Ronald J. Crowley,** professor of physics, California State University, Fullerton. **J. Dath,** professor of engineering, Ecole Royale Militaire, Brussels, Belgium. **Sid Deutsch,** professor of bioengineering, Tel Aviv University, Israel. **J. Dommanget,** astronomer, Royale Observatory, Brussels, Belgium. **Natham J. Duker,** assistant professor of pathology, Temple University. **Frederic A. Friedel,** philosopher, Hamburg, West Germany. **Robert E. Funk,** anthropologist, New York State Museum & Science Service. **Sylvio Garattini,** director, Mario Negri Pharmacology Institute, Milan, Italy. **Laurie Godfrey,** anthropologist, University of Massachusetts. **Gerald Goldin,** mathematician, Rutgers University. **Donald Goldsmith,** astronomer; president, Interstellar Media. **Clyde F. Herreid,** professor of biology, SUNY, Buffalo. **I. W. Kelly,** professor of psychology, University of Saskatchewan. **Richard H. Lange,** chief of nuclear medicine, Ellis Hospital, Schenectady, New York. **Gerald A. Larue,** professor of biblical history and archaeology, University of So. California. **Bernard J. Leikind,** staff scientist, GA Technologies Inc., San Diego. **Joel A. Moskowitz,** director of medical psychiatry, Calabasas Mental Health Services, Los Angeles. **Joe Nickell,** technical writing instructor, University of Kentucky. **Robert B. Painter,** professor of microbiology, School of Medicine, University of California. **John W. Patterson,** professor of materials science and engineering, Iowa State University. **Steven Pinker,** assistant professor of psychology, MIT. **James Pomerantz,** professor of psychology, SUNY, Buffalo. **Daisie Radner,** professor of philosophy, SUNY, Buffalo. **Michael Radner,** professor of philosophy, McMaster University, Hamilton, Ontario, Canada. **Robert H. Romer,** professor of physics, Amherst College. **Milton A. Rothman,** physicist, Philadelphia, Pa. **Karl Sabbagh,** journalist, Richmond, Surrey, England. **Robert J. Samp,** assistant professor of education and medicine, University of Wisconsin-Madison. **Steven D. Schafersman,** geologist, Houston. **Eugenie Scott,** physical anthropologist, University of Colorado-Boulder. **Stuart D. Scott, Jr.,** associate professor of anthropology, SUNY, Buffalo. **Al Seckel,** physicist, Pasadena, Calif. **Erwin M. Segal,** professor of psychology, SUNY, Buffalo. **Elie A. Shneour,** biochemist; director, Biosystems Research Institute, La Jolla, California. **Steven N. Shore,** New Mexico Institute of Mining and Technology, Socorro, N.M. **Barry Singer,** psychologist, Seal Beach, Calif. **Mark Slovak,** astronomer, University of Wisconsin-Madison. **Douglas Stalker,** associate professor of philosophy, University of Delaware. **Gordon Stein,** physiologist, author; editor of the *American Rationalist.* **Waclaw Szybalski,** professor, McArdle Laboratory, University of Wisconsin-Madison. **Ernest H. Taves,** psychoanalyst, Cambridge, Massachusetts.

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Astrology Subcommittee: Chairman, I. W. Kelly, Dept. of Educational Psychology, University of Saskatchewan, Saskatoon, Saskatchewan S7N 0W0, Canada.

Paranormal Health Claims Subcommittee: Co-chairmen, William Jarvis, Professor of Health Education, Dept. of Preventive Medicine, Loma Linda University, Loma Linda, CA 93350, and Stephen Barrett, M.D., P.O. Box 1747, Allentown, PA 18105.

Parapsychology Subcommittee: Chairman, Ray Hyman, Psychology Dept., Univ. of Oregon, Eugene, OR 97402.

UFO Subcommittee: Chairman, Philip J. Klass, 404 "N" Street S.W., Washington, D.C. 20024.

The Committee for the Scientific Investigation of Claims of the Paranormal

The Committee for the Scientific Investigation of Claims of the Paranormal attempts to encourage the critical investigation of paranormal and fringe-science claims from a responsible, scientific point of view and to disseminate factual information about the results of such inquiries to the scientific community and the public. To carry out these objectives the Committee:

- Maintains a network of people interested in critically examining claims of the paranormal.
- Prepares bibliographies of published materials that carefully examine such claims.
- Encourages and commissions research by objective and impartial inquiry in areas where it is needed.
- Convenes conferences and meetings.
- Publishes articles, monographs, and books, that examine claims of the paranormal.
- Does not reject claims on a priori grounds, antecedent to inquiry, but rather examines them objectively and carefully.

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